CITY OF LAKE ELSINORE

# CLIMATE ACTION PLAN

ADOPTED BY CITY COUNCIL: DECEMBER 13, 2011

CITY OF LAKE ELSINORE
DREAM EXTREME

# FINAL
# CITY OF LAKE ELSINORE
# CLIMATE ACTION PLAN

*PREPARED FOR:*

**THE CITY OF LAKE ELSINORE**
130 SOUTH MAIN STREET
LAKE ELSINORE, CA 92530

*PREPARED BY:*

**RINCON CONSULTANTS, INC.**
180 N. ASHWOOD AVENUE
VENTURA, CA 93003

**ADOPTED BY LAKE ELSINORE CITY COUNCIL: DECEMBER 13, 2011**

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## GLOSSARIES

Glossary of Acronyms
Glossary of Terms

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# Executive Summary

The City of Lake Elsinore Climate Action Plan (CAP) is a long-range plan to reduce community-wide greenhouse gas (GHG) emissions from activities within the City limits. Specifically, the CAP is designed to:

- Benchmark Lake Elsinore's existing (2008) GHG emissions and projected emissions relative to statewide emissions targets.
- Establish GHG emissions reduction strategies and measures to reduce the City's proportionate share of emissions to meet the statewide targets identified in Assembly Bill (AB) 32 and Executive Order S-3-05.
- Set forth procedures to monitor and verify the effectiveness of the CAP and require amendment if the CAP is not achieving targeted levels of emissions.
- Mitigate Lake Elsinore's GHG emissions impacts (by reducing GHG emissions consistent with the State of California via the California Environmental Quality Act [CEQA] Guidelines, AB 32, and Executive Order S-3-05). The CEQA Guidelines encourage the adoption of plans or mitigation programs as a means of comprehensively addressing the cumulative impacts of projects (see CEQA Guidelines, Sections 15064(h)(3), 15130(c)).
- Serve as the programmatic tiering document for the purposes of CEQA within the City of Lake Elsinore for GHG emissions, by which applicable projects will be reviewed. If a proposed development project can demonstrate it is consistent with the applicable emissions reduction measures included in the CAP, the programs and standards that would be implemented as a result of the CAP, and the General Plan Update growth projections, the project's environmental review pertaining to GHG impacts may be streamlined as allowed by CEQA Guidelines Sections 15152 and 15183.5.

The CAP is not intended to limit future development or economic growth within Lake Elsinore, nor is it intended to stop any individual project (as prescribed by the City's General Plan) from moving forward. The CAP is a strategy for Lake Elsinore to grow in a sustainable way that meets GHG reduction targets while continuing to allow for public and private development and redevelopment that will keep the City of Lake Elsinore a vibrant and livable community.

## Lake Elsinore's Greenhouse Gas Emissions

The Lake Elsinore GHG Emissions Inventory Report was prepared to identify the sources, distribution, and overall magnitude of GHG emissions generated within the City of Lake Elsinore and forecast how emissions would increase under business-as-usual conditions.[1] The analysis was completed using the Clean Air Climate Protection (CACP) software. The report includes a baseline inventory of community-wide and local government (municipal) emissions for the 2008 calendar year and a business-as-usual forecast for the years 2020 and 2030. In

[1] "Business-as-usual" conditions provide an estimate of how emissions will change over time if consumption trends and behavior continue as they did in 2008, absent of any new policies or actions that would reduce emissions.

reality, only a portion of the growth permitted by the General Plan will occur by 2030; however, in accordance with the California Attorney General's guidelines (Climate Change, CEQA & General Plans, 2009), the greenhouse gas emissions forecast accounts for the full extent of the growth permitted by the General Plan, providing a reasonable worst-case estimate of emissions.[2] This growth and the results of the inventory are shown in Table ES-1 and summarized below.

**Table ES-1. Summary of Lake Elsinore's Existing and Projected Greenhouse Gas Emissions and Development Assumptions (2008, 2020 and 2030)**

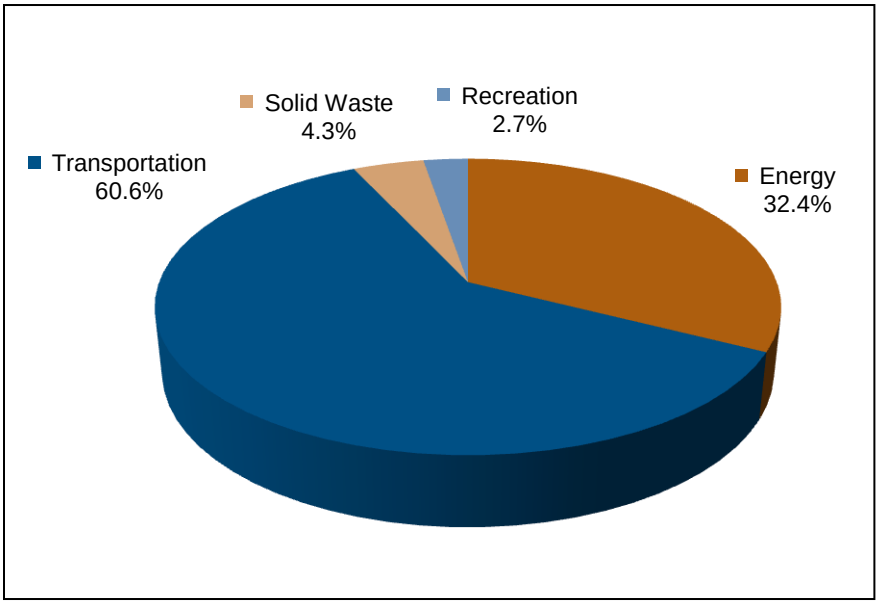
| | 2008 | 2020[1] | 2030[2] |
|---|---|---|---|
| **General Plan Development Assumptions** | | | |
| Population (residents) | 49,528 | 108,866 | 209,755 |
| Employment (jobs) | 10,287 | 34,276 | 93,482 |
| Service Population (population + employment) | 59,815 | 143,142 | 303,237 |
| **Community-Wide GHG Emissions** | | | |
| **Energy (MT $CO_2e$)** | **164,311** | **350,595** | **663,216** |
| *Residential* | *87,196* | *189,877* | *363,175* |
| *Commercial* | *68,461* | *149,079* | *285,142* |
| *Industrial* | *8,654* | *11,639* | *14,899* |
| Transportation (MT $CO_2e$) | 306,955 | 636,472 | 1,217,373 |
| Solid Waste (MT $CO_2e$) | 21,622 | 47,083 | 90,056 |
| Recreation (MT $CO_2e$) | 13,839 | 30,415 | 58,174 |
| **Total GHG Emissions (MT $CO_2e$)** | **506,727** | **1,064,565** | **2,028,819** |
| **Emissions Per Service Population (MT $CO_2e$/SP)** | **8.5** | **7.4** | **6.7** |

[1] 2020 population and employment is based on interpolation between 2008 and 2030 data.
[2] 2030 population and employment is based on full buildout of proposed land uses with the City limits under the General Plan.

As shown in Table ES-1, in 2008, Lake Elsinore emitted 506,727 metric tons of carbon dioxide equivalent GHGs (MT $CO_2e$), or 8.5 MT $CO_2e$ per "service population," defined as residents plus employees (MT $CO_2e$/SP).[3] The transportation sector was the largest source of emissions, accounting for 60.6% of the total community-wide emissions (see Figure ES-1). Energy consumed in residential, commercial, and industrial buildings accounted for 32.4% of the community's total emissions. The landfilled portion of the community's solid waste contributed to 4.3% of the total community-wide emissions, while the recreation sector contributed the remaining 2.7%. Emissions from City government (municipal) activities constituted 0.9% of the community's total emissions, or 4,324 MT $CO_2e$.

[2] According to the California Attorney General's Office, "The lead agency must disclose and analyze the full extent of the development allowed by the proposed general plan, including associated greenhouse gas emissions…The lead agency can't rely on the fact that full buildout may not occur, or that its timing is uncertain, to avoid its obligation to disclose the impacts of the development that the general plan would permit" (Climate Change, CEQA & General Plans, 2009).
[3] Service population (SP) is an efficiency-based measure used to estimate the development potential of the General Plan area. It is determined by adding the number of residents to the number of jobs estimated for a given point in time.

**Figure ES-1**
**Community-Wide Emissions by Sector (2008)**




Under forecasted business-as-usual conditions, and accounting for the full extent of the growth permitted under the General Plan (see Table ES-1), Lake Elsinore's GHG emissions are projected to increase to 1,064,565 MT $CO_2e$ in 2020, which is equivalent to 7.4 MT $CO_2e$ per resident or employee in the City's service population, and to 2,028,819 MT $CO_2e$ in 2030, which equates to 6.7 MT $CO_2e$ per resident or employee in the City's service population. While only a portion of the development permitted by the General Plan will occur by 2030, it is unlikely that Lake Elsinore's community-wide emissions will increase to this level. In addition, although overall emissions are projected to increase, emissions per service population are projected to decrease.

## Lake Elsinore's Emissions Targets

The City has made considerable effort to select emissions reduction targets that are both ambitious and practical, and consistent with AB 32 and Executive Order S-3-05. For local governments, there are several types of reduction targets that may be supported by substantial evidence and be consistent with the AB 32 and Executive Order S-3-05 targets, such as 1990 levels, a performance standard (% reduction) or an efficiency metric (e.g., emissions per capita or service population) (California Air Pollution Control Officers Association [CAPCOA], 2008).

The City selected efficiency-based targets for the years governed by the General Plan to reduce community-wide emissions to 6.6 MT $CO_2e$ per service population per year by 2020 (a 22.3% reduction from the 2008 rate of 8.5 MT $CO_2e$/SP) and to 4.4 MT $CO_2e$ per service population per year by 2030 (a 48.2% reduction from the 2008 rate of 8.5 MT $CO_2e$/SP). These efficiency-based targets represent the AB 32 and Executive Order S-3-05 targeted emissions levels for 2020 and

2030 on a per service population basis.[4] They were derived by dividing the statewide AB 32 targeted emissions level for 2020 and statewide Executive Order S-3-05 targeted emissions level for 2030 by the 2020 and 2030 statewide service population respectively. Therefore, these targets represent the maximum quantity of emissions each resident and employee in the State of California could emit in 2020 and 2030 based on emissions levels necessary to achieve the statewide AB 32 and Executive Order S-3-05 GHG emissions reduction goals.

The Bay Area Air Quality Management District (BAAQMD) was the first agency to adopt the 6.6 MT $CO_2e$/SP target which is applicable statewide and has received praise from the California Attorney General's Office (BAAQMD, June 2010; California Attorney General's Office, December 2009). It is specifically intended for use in evaluating the significance of GHG emissions from General Plans and their consistency with AB 32. In addition, the South Coast Air Quality Management District (SCAQMD), in which Lake Elsinore located, recommends the use of, and is proposing to adopt, the 6.6 MT $CO_2e$/SP target for 2020, as well as a year 2035 target of 4.1 MT $CO_2e$/SP for plan-level projects such as the CAP and General Plan (SCAQMD, Proposed Tier 4 Performance Standards, September 2010).

As shown in Table ES-2 below, Lake Elsinore's 2020 business-as-usual emissions are projected to be 1,064,565 MT $CO_2e$, or 7.4 MT $CO_2e$/SP (based on an estimated 2020 service population of 143,142 residents and employees) and 2030 business-as-usual emissions are projected to be 2,028,819 MT $CO_2e$, or 6.7 MT $CO_2e$/SP (based on a 2030 service population of 303,237 residents and employees). Therefore to meet the 2020 and 2030 efficiency targets of 6.6 MT $CO_2e$/SP (equivalent to 944,737 MT $CO_2e$ total based on a 2020 service population of 143,142) and 4.4 MT $CO_2e$/SP (equivalent 1,334,243 MT $CO_2e$ total based on a 2030 service population of 303,237), Lake Elsinore will need to reduce its emissions by 0.8 MT $CO_2e$/SP/yr (a total of 119,828 MT $CO_2e$/yr) by 2020 and by 2.3 MT $CO_2e$/SP/yr (a total of 694,576 MT $CO_2e$/yr) by 2030.

**Table ES-2. GHG Emissions Projections and Required Reductions**

| | 2020 (MT $CO_2e$) | 2020 (MT $CO_2e$/SP[1]) | 2030 (MT $CO_2e$) | 2030 (MT $CO_2e$/SP) |
|---|---|---|---|---|
| **Projected Business-as-Usual GHG Emissions** | 1,064,565 | 7.4 | 2,028,819 | 6.7 |
| **GHG Emissions Target** | 944,737 | 6.6 | 1,334,243 | 4.4 |
| **Reduction Required to Meet Target** | 119,828 | 0.8 | 694,576 | 2.3 |

[1] SP = Service Population; 2020 service population = 143,142; 2030 service population = 303,237

[4] AB 32 sets the target of reducing statewide emissions to 1990 levels by 2020; Executive Order S-3-05 calls for the reduction of statewide emissions to 80% below 1990 levels by 2050. The Attorney General's Office (2009) recommends that local governments establish targets for the years governed by the general plan that align with the AB 32 and Executive Order S-3-05 emissions reduction trajectory. 2030 statewide targeted emissions were extrapolated based on a linear projection from the 2020 target (1990 levels) to the 2050 target (80% below 1990 levels).

# Emissions Reduction Strategies and Measures

To meet the emissions reduction targets, the CAP identifies a combination of state-level regulations and local strategies and measures in the focus areas of Transportation and Land Use, Energy, Solid Waste, and Public Education and Outreach. The strategies and measures were selected to build on the policy direction of the General Plan, and take into consideration planned City capital improvements, policies of neighboring jurisdictions and regional agencies, regional and statewide best practices, public and private costs and savings; co-benefits; measures recommended by the State Attorney General's Office, California Air Resources Board (CARB) and California Air Pollution Control Officers Association (CAPCOA); City staff input, public comments, and other information provided by residents and stakeholders collected during the public outreach process.

Each focus area includes emissions reduction strategies with a series of implementation measures. Measures define the programs, policies, and projects that the City will implement to accomplish its reduction targets. Each measure is presented with its GHG emissions reduction potential, performance criteria to track progress, estimated implementation costs and savings.

## Transportation and Land Use

Transportation-related emissions make up the largest part (60.6%) of Lake Elsinore's 2008 GHG emissions inventory. The majority of these emissions result from the use of fuel (e.g., gasoline, diesel, etc.) to power cars and trucks within Lake Elsinore. Factors affecting transportation emissions include vehicle miles traveled, vehicle type and the overall system infrastructure. In addition, these factors are directly influenced by the geographic distribution of people and places, especially the density of development and zoning. Therefore, land use measures are included in this focus area. The transportation and land use emissions reduction measures set forth in the CAP are organized under the following strategies to reduce transportation-related emissions:

- Increase bicycle, pedestrian and public transit travel
- Manage vehicle parking
- Increase efficiency of land use patterns
- Reduce trips
- Increase the use of low- and zero-emissions vehicles

These GHG emissions reduction strategies would reduce emissions by approximately 62,138 MT $CO_2e$/yr (or 0.4 MT $CO_2e$/SP/yr) by 2020 and 124,279 MT $CO_2e$/yr (or 0.4 MT $CO_2e$/SP/yr) by 2030.

## Energy

Energy-related emissions make up the second largest part (32.4%) of Lake Elsinore's 2008 emissions inventory. These emissions result from use of fossil fuels, including coal, oil and gas for energy production, which is used to heat, cool and provide power to residential, commercial and industrial buildings, and other facilities in Lake Elsinore. The energy-related reduction

measures set forth in the CAP are organized under the following strategies to reduce energy-related emissions:

- Increase energy efficiency of new construction
- Increase energy efficiency of existing buildings
- Increase energy efficiency of municipal buildings and facilities
- Reduce water consumption
- Increase the use of renewable energy

These GHG emissions reduction strategies would reduce emissions by approximately 89,131 MT $CO_2e$/yr (0.6 MT $CO_2e$/SP/yr) by 2020 and 177,817 MT $CO_2e$/yr (or 0.6 MT $CO_2e$/SP/yr) by 2030.

## Solid Waste

Solid waste results in GHG emissions as it is transported to and decomposes in landfills. As this sector makes up 4.3% of Lake Elsinore's 2008 emissions inventory, reducing the overall amount of solid waste generated and diverting solid waste from landfills can reduce solid waste-related GHG emissions. The solid waste-related reduction measures set forth in the CAP are organized under the following strategies to reduce related emissions:

- Increase solid waste diversion
- Decrease solid waste generated

These GHG emissions reduction strategies would reduce emissions by approximately 8,427 MT $CO_2e$/yr (or 0.1 MT $CO_2e$/SP/yr) by 2020 and 9,525 MT $CO_2e$/yr (or 0.03 MT $CO_2e$/SP/yr) by 2030.

## Community Education and Outreach

Education and outreach are key components of climate action planning because of the changes in citizen behavior that are needed to reduce emissions. The community education and outreach measures identified in the CAP are organized under the following strategy:

- Expand community education and outreach

This GHG emissions reduction strategy supports the implementation and effectiveness of the transportation and land use, energy, and solid waste strategies and therefore does not have separate emissions reduction estimates.

## State-Level Measures

The AB 32 Climate Change Scoping Plan identifies several state-level regulations and measures that are anticipated to reduce GHG emissions within Lake Elsinore. These include the Pavley Regulations, Low Carbon Fuel Standards, heavy/medium duty and passenger vehicle efficiency regulations, and the Renewable Portfolio Standard. These state-level measures are

anticipated to reduce emissions in Lake Elsinore by 239,528 MT $CO_2e$/yr (or 1.7 MT $CO_2e$/SP/yr) by 2020 and by 456,484 MT $CO_2e$/yr (or 1.5 MT $CO_2e$/SP/yr) by 2030.

## Meeting the Targets

As shown in Table ES-3 below, the combination of state-level measures and local strategies and measures identified in the CAP will allow Lake Elsinore to meet, if not exceed, the overall service population target of 6.6 MT $CO_2e$/SP in 2020 and 4.4 MT $CO_2e$/SP in 2030.

**Table ES-3. Reduction Target Analysis**

| Reduction Focus Area | 2020 Reduction Potential (MT $CO_2e$) | 2020 Reduction Potential (MT $CO_2e$/SP[1]) | 2030 Reduction Potential (MT $CO_2e$) | 2030 Reduction Potential (MT $CO_2e$/SP[1]) |
|---|---|---|---|---|
| Total Reduction from Transportation and Land Use Measures | 62,138 | 0.4 | 124,279 | 0.4 |
| Total Reduction from Energy Measures | 89,131 | 0.6 | 177,817 | 0.6 |
| Total Reduction from Solid Waste Measures | 8,427 | 0.1 | 9,525 | 0.03 |
| Total Reduction from Education and Outreach Measures | Contributes to other measures | | Contributes to other measures | |
| Total Reduction from State-Level Regulations | 239,528 | 1.7 | 456,484 | 1.5 |
| **Total Reduction from Measures** | **399,224** | **2.8** | **768,105** | **2.5** |
| | | | | |
| **Projected Emissions with CAP Measures** | **665,341** | **4.6** | **1,260,714** | **4.2** |
| **GHG Emissions Target** | **944,737** | **6.6** | **1,334,243** | **4.4** |
| **Reduction Beyond Target** | **279,396** | **2.0** | **73,529** | **0.2** |

[1] SP = Service Population; 2020 service population = 143,142; 2030 service population = 303,237

# Plan Implementation and Monitoring

Ensuring that the measures translate to on-the-ground results is critical to the success of the CAP. To facilitate this, each measure identifies the responsible departments, means of implementation, status and implementation time frame. Measure implementation is separated into three phases: short-term (2011-2013), mid-term (2014-2020) and long-term (2021-2030).

In order to ensure that Lake Elsinore is achieving its targeted level of emissions, City staff will monitor plan performance over time and alter or amend the plan if it is not achieving the proposed reduction targets. The City will use two important types of monitoring to evaluate performance: evaluation of the plan as a whole and evaluation of individual measures.

City staff will monitor the implementation and performance of individual measures and will re-inventory its emissions every five years to evaluate overall CAP performance. This will enable the City to identify any need for adjustments to the emissions reduction measures if Lake Elsinore's GHG emissions are not in line with the targets.

# 1.0 Introduction

Although climate change is a global issue, the State of California is on the forefront of developing strategies to reduce statewide greenhouse gas (GHG) emissions. In 2005, Governor Schwarzenegger issued Executive Order S-3-05 to reduce statewide GHG emissions to 1990 levels by 2020 and to 80% below 1990 levels by 2050. Enactment of several, related pieces of climate action legislation quickly followed, including Assembly Bill (AB) 32, which codified the 2020 target, and Senate Bill (SB) 97. These laws together create a framework for GHG emissions reductions and identify local governments as having a vital role to play in assisting the State to meet these mandates.

The City of Lake Elsinore Climate Action Plan (CAP) is the City's long-range plan to reduce its proportionate share of GHG emissions to help meet the statewide targets identified in AB 32 and Executive Order S-3-05. The CAP describes the activities in Lake Elsinore that generate GHG emissions, quantifies existing (2008) emissions, and projects future trends. It also provides a roadmap for achieving statewide GHG emissions reduction targets, identified in AB 32 and Executive Order S-3-05.

Implementation of the CAP will reduce Lake Elsinore's emissions in support the State of California's emissions reduction targets. The CAP is also intended to support tiering and streamlining of future projects within Lake Elsinore pursuant to CEQA Guidelines Sections 15152 and 15183.5 (see Section 1.4 below).

The CAP is not intended to limit future development or economic growth within Lake Elsinore, nor is it intended to stop any individual project (as prescribed by the General Plan) from moving forward. The CAP is a strategy for Lake Elsinore to grow in a sustainable way that meets GHG reduction goals while continuing to allow for public and private development and redevelopment that will keep Lake Elsinore a vibrant and livable community.

## 1.1 Content

The CAP is organized into the following chapters:

**1.0 Introduction –** This chapter provides an overview of the CAP and its contents and summarizes the planning process to develop the document. It also explains the relationship between the CAP and the General Plan and the CAP and CEQA.

**2.0 Climate Change Science and Policy –** This chapter describes the relationship between GHG emissions and climate change. It also identifies existing international, federal, state, and regional policies aimed at reducing GHG emissions.

**3.0 Greenhouse Gas Emissions Inventory Results –** This chapter summarizes the results of the City of Lake Elsinore GHG Emissions Inventory. It identifies Lake Elsinore's major sources of emissions, estimates the amount of GHGs emitted from each source in 2008, and forecasts how emissions could increase in Lake Elsinore if no changes are made to reduce emissions. The complete GHG Emissions Inventory Report is included in the CAP as Appendix A.

**4.0 Emissions Reduction Targets** – This chapter identifies Lake Elsinore's GHG emissions reduction targets for 2020 and 2030 and demonstrates their consistency with AB 32 and Executive Order S-3-05.

**5.0 Strategies and Measures** – This chapter identifies strategies and measures to reduce municipal and community-wide GHG emissions in the categories of energy, transportation and land use, solid waste, and community education and outreach. It also includes performance standards that are anticipated to collectively achieve the specified targets.

**6.0 Implementation and Monitoring** – This chapter provides a matrix for implementation of identified emissions reduction measures through 2030. It also sets forth procedures to monitor the CAP's performance and amend the plan if it is not achieving targeted reduction levels.

## 1.2 Planning Process

City staff and its consultants worked with members of the community, elected officials, and representatives from various departments within the City government to develop the CAP. In April 2010, the City hosted a community workshop to review the results of the GHG emissions inventory and gather ideas for the CAP. The Lake Elsinore CAP website also provided community members with an opportunity to learn about climate action planning and participate in the formulation of the CAP through two online surveys and a comment/suggestion page. Based on feedback received from the community during and after the April 2010 workshop, the City and its consultants developed a list of recommended emissions reduction measures, which were reviewed by the Community Development and Public Works Departments. The proposed measures were also analyzed in more detail based on implementation cost, future savings, potential emissions reductions and ease of implementation. A draft was circulated for public comment along with the General Plan and Environmental Impact Report (EIR).

## 1.3 Relationship to General Plan

The CAP was prepared concurrently with the City's General Plan and EIR, to serve as the City's primary information and policy document for GHG emissions reductions. The General Plan, which provides the supporting policy framework for land use and development in the City through the year 2030, references the CAP instead of including it as part of the General Plan itself. Though both the General Plan and CAP are long-range plans, the CAP may be updated on a more regular basis to add and amend emissions reduction measures as new information, policy guidance, and regulations regarding GHG emissions evolve, and new information and technologies to address GHG emissions are developed.

## 1.4 Relationship to the California Environmental Quality Act

In order to analyze and reduce potentially significant GHG emissions resulting from development under the City of Lake Elsinore General Plan, the City's approach was to develop a CAP that does the following:

- Quantifies GHG emissions for the base year 2008, as well as projected emissions for the years 2020 and 2030, resulting from activities within the City of Lake Elsinore's jurisdictional boundary.
- Establishes GHG emissions targets for the years 2020 and 2030 that are based on the State of California's emissions targets identified in AB 32 and Executive Order S-3-05.
- Identifies GHG emissions reduction measures in the areas of transportation and land use, energy, solid waste and community education and outreach that will collectively achieve the City's emissions targets.
- Sets forth procedures to monitor the City's progress towards its emissions targets and to allow for necessary CAP revisions if the plan is not achieving specified levels.
- Undergoes environmental review and gets adopted in a public process.

This approach is consistent with CEQA Guidelines, Section 15183.5, which allows jurisdictions to analyze and mitigate the significant effects of GHG emissions at a programmatic level by adopting a plan for the reduction of GHG emissions. Once the CAP is adopted following environmental review, later projects consistent with the General Plan growth potential and CAP may tier from and/or incorporate the CAP by reference in their cumulative GHG impact analyses.

A project-specific environmental document that relies on the CAP for its cumulative impact analysis must identify the CAP measures that apply to the project and demonstrate how the project incorporates or is consistent with them. In order to demonstrate project-level compliance with CEQA relevant to GHG emissions impacts, applications for discretionary projects must demonstrate the following:

- How the project is consistent with the CAP, and incorporates all applicable measures from the CAP as binding and enforceable components of the project.
- How the project is consistent with the General Plan land use designations and population and employment growth projections within the City limits upon which the CAP modeling is based.

Appendix D contains a worksheet that project applicants may use to demonstrate project-level compliance with these items. In addition, project-level GHG emissions impact analyses can utilize the California Emissions Estimator Model (CalEEMod), or other appropriate software, to determine compliance.[1] If it is determined that a proposed project does not fall within the

[1] CalEEMod was created by the South Coast Air Quality Management District (SCAQMD) in collaboration with the other California Air Districts to provide an accurate and comprehensive tool for quantifying GHG impacts from land use projects throughout California. This model is available for public download on CalEEMod's website located at http://www.caleemod.com/.

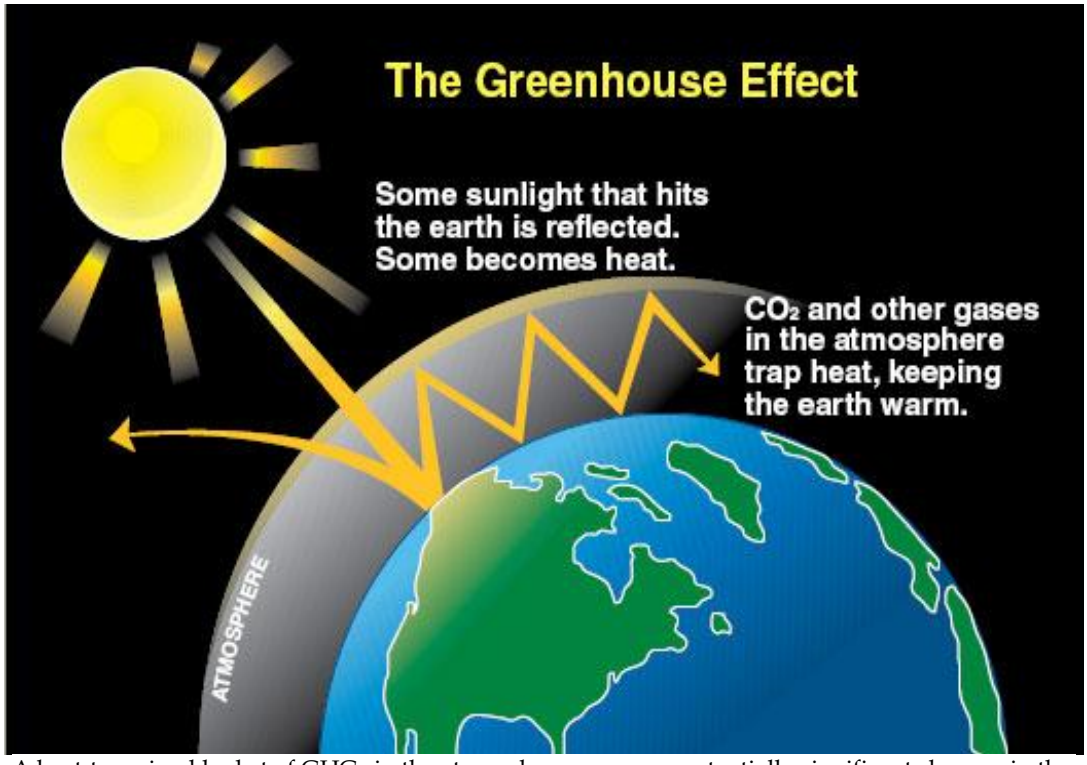
assumptions of the General Plan and/or is not consistent with the CAP, incorporating all applicable measures as binding and enforceable components of the project, further CEQA analysis would be required. The applicant must demonstrate to the City's satisfaction how the project will achieve its share of the established targets through the use of alternative design components and/or operational protocols to achieve equivalent reductions, or use permanent, verifiable and enforceable local offsets that would result in emissions reductions to achieve remaining reductions. The applicant would also be required to demonstrate that his or her proposed project would not substantially interfere with implementation of the CAP strategies or measures.

# 2.0 Climate Change Science and Policy

## 2.1 Scientific Background

Energy from the Sun drives the Earth's weather and climate. The Earth absorbs energy from the Sun and also radiates energy back into space. According to the U.S. Environmental Protection Agency (USEPA), a greenhouse gas (GHG) is any gas that absorbs this energy in the Earth's atmosphere. This absorption traps heat within the atmosphere, maintaining Earth's surface temperature at a level higher (by about 60°F) than would be the case in the absence of GHGs (see Figure 2-1 of The Greenhouse Effect) (USEPA, 2010). GHGs include water vapor, carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride ($SF_6$), halogenated chlorofluorocarbons (HCFCs), and ozone ($O_3$). Naturally occurring GHGs include water vapor, $CO_2$, $CH_4$, $N_2O$, and $O_3$. Human activities add to the levels of most of these naturally occurring GHGs (Intergovernmental Panel on Climate Change [IPCC], 2007). Other GHGs (e.g., HFCs and PFCs) are created and emitted solely through human activities. The principal GHGs that enter the atmosphere because of human activities are discussed later in this section.

**Figure 2-1**
**The Greenhouse Effect**


The Greenhouse Effect
Some sunlight that hits the earth is reflected. Some becomes heat.
$CO_2$ and other gases in the atmosphere trap heat, keeping the earth warm.
ATMOSPHERE

A heat-trapping blanket of GHGs in the atmosphere can cause potentially significant changes in the timing and length of the seasons, temperature, and amount and frequency of precipitation. *Source: Washington State Department of Ecology, 2010.*

Increasing levels of GHGs in the atmosphere result in an increase in the temperature of the Earth's lower atmosphere, a phenomenon which is commonly referred to as global warming. Warming of the Earth's lower atmosphere induces a suite of additional changes including changes in: global precipitation patterns; ocean circulation, temperature and acidity; wind patterns; and storms. These large-scale changes over an extended period of time are collectively referred to as climate change (USEPA, 2010).

**Climate change** is a change in the average weather that a given region experiences and is measured by changes in temperature, precipitation, wind patterns and storms over an extended period of time (typically decades or longer).

**Global climate change** refers to change in the climate of the Earth as a whole.

**Global warming** is an average increase in the temperature of the atmosphere near the Earth's surface and in the troposphere, which can contribute to changes in global climate patterns.

The global climate is continuously changing, as evidenced by repeated episodes of substantial warming and cooling documented in the geologic record. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years, with GHG concentrations never higher than 300 parts per million (ppm) (National Oceanic & Atmospheric Administration [NOAA], 2009; IPCC, 2007). The past 10,000 years have been marked by a period of incremental warming. However, scientists have observed acceleration in the rate and magnitude of change over the past 150 years, corresponding with the beginning of the Industrial Revolution (IPCC, 2007; Trans & Keeling, 2011).

In 1988, the United Nations Environment Programme and the World Meteorological Organization established the Intergovernmental Panel on Climate Change (IPCC) established to assess scientific, technical and socioeconomic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. As the leading authority on climate change science, the IPCC draws upon hundreds of the world's expert scientists as authors and thousands as expert reviewers. According to the IPCC's Fourth Assessment Report (2007), over the past 150 years, since the industrial era, activities such as the use of fossil fuels (i.e., coal, natural gas, oil and gasoline) to power cars, factories, utilities and appliances have substantially added to the amount of GHGs in the atmosphere. For example, carbon dioxide concentrations rose from 280 ppm in 1750 to over 391 ppm in 2011, and are rising at on average 1.66 ppm per year (IPCC, 2007; National Oceanic and Atmospheric Association [NOAA], 2011). The annual growth rate of carbon dioxide has also increased, averaging about 1.43 ppm per year before 1995 and 1.91 ppm per year thereafter. This increase in carbon dioxide and other GHGs - including methane, nitrous oxide, and fluorinated gases - correlates with the recent increase in global average temperature (which has risen approximately 1.4°F since the early 20th century) (IPCC, 2007; NOAA, 2009).

The principal GHGs that enter the atmosphere as a result of human activities include:

- **Carbon dioxide ($CO_2$)** is released into the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.

- **Methane ($CH_4$)** is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from agricultural practices, such as the raising of livestock, and by the decomposition of organic waste in landfills.
- **Nitrous oxide ($N_2O$)** is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- **Fluorinated gases** (i.e., hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) are emitted from a variety of industrial processes. These gases are typically emitted in smaller quantities but are generally very strong GHGs.

Each of the GHGs listed above differs in its ability to absorb heat in the atmosphere, or in its "global warming potential." The global warming potential of the various GHGs is based upon a comparison with carbon dioxide, which is set at one. For example, methane absorbs 21 times more heat per molecule than carbon dioxide and nitrous oxide absorbs 310 times more heat per molecule than carbon dioxide. Therefore, it is common practice to report emissions in terms of carbon dioxide equivalents ($CO_2e$) by multiplying the amount of each GHG by its global warming potential. Table 2-1 shows the global warming potential for the most abundant six GHGs.

**Table 2-1. Global Warming Potential of GHGs for a 100-Year Period**

| Greenhouse Gas | Global Warming Potential |
|---|---|
| Carbon Dioxide ($CO_2$) | 1 |
| Methane ($CH_4$) | 21 |
| Nitrous Oxide ($N_2O$) | 310 |
| Hydroflourocarbons (HFCs) | 140-11,700 |
| Perflourocarbons (PFCs) | 6,500-9,200 |
| Sulfur Hexaflouride ($SF_6$) | 23,900 |

*Source: Intergovernmental Panel on Climate Change, 1996.*

# 2.2 (Reserved)

# 2.3 Regulatory Setting

In an effort to stabilize GHGs and reduce impacts associated with climate change, international, federal, state, regional and local agencies are taking action. These agencies work jointly and individually to address GHG emissions through legislation, regulations, planning, policy-making, education, and a variety of programs. This section summarizes these actions.

## 2.3.1 International

The *United Nations Framework Convention on Climate Change* (UNFCC) is an international environmental treaty produced by the United Nations in 1992. The objective of the treaty is "stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous

anthropogenic interference with the climate system." This is generally understood to be achieved by stabilizing global GHG concentrations between 350 and 400 ppm, in order to limit the global average temperature increases between 2 and 2.4°C above pre-industrial levels (IPCC, 2007). The UNFCC itself does not set limits on GHG emissions for individual countries or enforcement mechanisms. Instead, the treaty provides for updates, called "protocols," that would identify mandatory emissions limits.

Five years later, the UNFCC brought nations together again to draft the *Kyoto Protocol* (1997). The Protocol established commitments for industrialized nations to reduce their collective emissions of six GHGs (carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons) to 5.2 percent below 1990 levels by 2012. The United States is a signatory of the Protocol but has not ratified it.

### 2.3.2 Federal

**Supreme Court Ruling.** The USEPA is the Federal agency responsible for implementing the Clean Air Act. The United States Supreme Court ruled in its decision in *Massachusetts et al. v. Environmental Protection Agency et al*. ([2007] 549 U.S. 05-1120), issued on April 2, 2007, that carbon dioxide is an air pollutant as defined under the Clean Air Act and that the EPA has the authority to regulate emissions of GHGs as pollutants. To date, the EPA has not developed a regulatory program for GHG emissions.

**Energy Independence and Security Act.** The Energy Independence and Security Act of 2007 includes several key provisions that will increase energy efficiency and the availability of renewable energy, which will reduce GHG emissions as a result. First, the Act sets a Renewable Fuel Standard that requires fuel producers to use at least 36 billion gallons of biofuel by 2022. Second, it increased Corporate Average Fuel Economy (CAFE) Standards to require a minimum average fuel economy of 35 miles per gallon for the combined fleet of cars and light trucks by 2020. Third, the adopted bill includes a variety of new standards for lighting and for residential and commercial appliance equipment. The equipment includes residential refrigerators, freezers, refrigerator-freezers, metal halide lamps, and commercial walk-in coolers and freezers.

### 2.3.3 State of California

California has adopted executive orders and enacted legislation to reduce statewide GHG emissions. State actions affecting Lake Elsinore are described below.

**Executive Order S-3-05.** Executive Order S-3-05, issued in 2005, was the first comprehensive state policy to address climate change. It established ambitious GHG reduction targets for the state: reduce GHG emissions to 2000 levels by 2010, to 1990 levels by 2020 and to 80% below 1990 levels by 2050. These targets reflect the worldwide emission reduction trajectory identified by the IPCC as being necessary to avert dangerous climate change (IPCC, 2007).

This Executive Order is binding only for state agencies and has no force of law for local governments. However, S-3-05 is important for two reasons. First, it obligated state agencies to implement GHG emission reduction strategies. Second, the signing of the Order sent a clear signal to the Legislature about the framework and content for legislation to reduce GHG emissions as a necessary step toward climate stabilization.

**Assembly Bill 32 (California Global Warming Solutions Act of 2006).** AB 32 codified the State's 2020 GHG emissions target by directing the California Air Resources Board (CARB) to reduce California's statewide emissions to 1990 levels by 2020. In December 2007, CARB identified the 2020 target (equal to statewide emissions in 1990) of 426.6 million metric tons of carbon dioxide equivalent (MMT $CO_2E$) gases.

In addition to identifying the 2020 target, AB 32 also required CARB to develop a policy plan for reaching the 2020 emissions target and to adopt and enforce regulations to implement the plan. The resulting AB 32 *Climate Change Scoping Plan* (herein referred to as "Scoping Plan") was adopted by CARB in December 2008. Key elements of the plan for achieving the 2020 target include:

- Adopting and implementing measures pursuant to existing state laws and policies, including California's goods movement measures and the Low Carbon Fuel Standard;
- Expanding energy efficiency programs and green building practices;
- Reducing methane emissions at landfills;
- Developing a California cap-and-trade program;
- Establishing and seeking to achieve reduction targets for transportation-related GHG emissions;
- Increasing waste diversion, composting, and commercial recycling toward zero-waste;
- Strengthening water efficiency programs; and
- Preserving forests that sequester carbon dioxide.

Although the Scoping Plan does not identify specific reductions for local governments, it identifies overall reductions from local government operations and land use decisions as a strategy to meet the 2020 target. The Scoping Plan states that land use planning and urban growth decisions will play an important role in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. It further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. However, AB 32 stopped short of setting mandatory targets for local government compliance. It encourages local governments to adopt a reduction target for municipal and community-wide emissions that parallels the AB 32 goal. Given that identifying 1990 emissions levels can be difficult for some local governments, a reduction of approximately 15% below 2005 levels is given as a rough equivalency where a local government has grown roughly at the same rate as the State (1% per year).

**Senate Bill 1078, Senate Bill 107, and Senate Bill 2X (Renewables Portfolio Standard).** Established in 2002 under SB 1078, and accelerated in 2006 under SB 107, California's Renewables Portfolio Standard (RPS) required investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources by at least 1% of their retail sales annually, until they achieved 20% by 2010. SB 2X raises the target from the current 20%, requiring private and public utilities to obtain 33% of their electricity from renewable energy sources by 2020. Increased use of renewable energy

sources will decrease California's reliance on fossil fuels, reducing emissions of GHGs from the energy sector.

**Assembly Bill 1493 (Pavley Regulations).** AB 1493 (referred to as Pavley I) required CARB to develop and adopt standards for vehicle manufacturers to reduce GHG emissions coming from passenger vehicles and light-duty trucks at a "maximum feasible and cost effective reduction" by January 1, 2005. Pavley I took effect for model years starting in 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III GHG" will cover 2017 to 2025. Fleet average emission standards would reach 22% reduction by 2012 and 30% by 2016.

**Executive Order S-1-07 (Low Carbon Fuel Standard).** This 2007 order will require fuel providers (e.g., producers, importers, refiners, and blenders) to ensure that the mix of fuels they sell in California meets the statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10% by the 2020 target.

**Senate Bill 1368.** SB 1368 (2006) directs the California Energy Commission and the California Public Utilities Commission to adopt a performance standard for GHG emissions for the future electricity used in California, regardless of whether it is generated in-state or purchased from other states.

**California Green Building Code.** The California Green Building Code (2008) referred to as "CalGreen," is the first statewide green building code. It was developed to provide a consistent, approach for green building within California. Taking effect January 2011, it lays out minimum requirements for newly constructed buildings in California, which will reduce GHG emissions through improved efficiency and process improvements. It requires builders to install plumbing that cuts indoor water use by as much as 20%, to divert 50% of construction waste from landfills to recycling, and to use low-pollutant paints, carpets, and floors.

**Senate Bill 1 (Million Solar Roofs).** SB 1 (2006) sets a goal to install 3,000 megawatts of new solar capacity by 2017 - moving the state toward a cleaner energy future and helping lower the cost of solar systems for consumers. The Million Solar Roofs Program is a ratepayer-financed incentive program aimed at transforming the market for rooftop solar systems by driving down costs over time. It provides up to $3.3 billion in financial incentives that decline over time.

**Assembly Bill 811.** AB 811 (2008) authorizes California cities and counties to designate districts within which willing property owners may enter into contractual assessments to finance the installation of renewable energy generation and energy efficiency improvements that are permanently fixed to the property. These financing arrangements would allow property owners to finance renewable energy generation and energy efficiency improvements through low-interest loans that would be repaid as an item on the property owner's property tax bill.

**Senate Bill 375.** SB 375, signed in 2008, supports implementation of AB 32 by aligning regional transportation planning efforts with land use and housing allocations in order to reduce transportation-related GHG emissions. Specifically, SB 375 directed CARB to set regional GHG emissions targets for passenger vehicles and light trucks for the years 2020 and 2035 for each Metropolitan Planning Organization (MPO) region, which were adopted in February 2011. For the Southern California Association of Governments (SCAG), the City of Lake Elsinore's MPO, CARB issued an 8% per capita reduction target from 2005 levels by 2020 and a 13% per capita

reduction target from 2005 levels by 2035. These targets apply to the SCAG region as a whole, and not to individual cities or subregions. Furthermore, SB 375 requires each MPO to prepare a "sustainable communities strategy (SCS)" that demonstrates how the region will meet its GHG reduction target through integrated land use, housing and transportation planning. If the combination of measures in the SCS will not meet the region's target, the MPO must prepare a separate "alternative planning strategy (APS)" to meet the target.

**Senate Bill 97.** SB 97 (2007) acknowledges that climate change is a prominent environmental issue that requires analysis under the California Environmental Quality Act (CEQA). SB 97 directed the Governor's Office of Planning and Research to develop CEQA-required guidelines for the mitigation of GHG emissions or the effects of GHG emissions, which were adopted on December 30, 2009.

**Executive Order S-13-08.** Executive Order S-13-08, signed on November 14, 2008, directs California to develop methods for adapting to climate change impacts through preparation of a statewide plan. In response to this order, the California Natural Resources Agency developed the California Climate Adaptation Strategy, which was adopted in September 2009. This document summarizes the best known science on climate change impacts in seven specific sectors and provides recommendations on how to manage against those threats.

### 2.3.4 Regional

The City of Lake Elsinore is part of the Southern California Association of Governments (SCAG). SCAG undertakes planning and policy initiatives that affect the greater Southern California region with the goal of encouraging a more sustainable Southern California. In 2004, SCAG adopted its *Compass Blueprint Growth Vision Report* to encourage sustainable development that reduces GHG emissions. The Compass Blueprint is a preferred vision for growth for the region; it has been incorporated into immediate housing allocation and transportation planning decisions. It provides a framework to help SCAG jurisdictions address growth management cooperatively and coordinate regional land use and transportation planning.

SCAG's 2008 *Regional Comprehensive Plan* is an advisory document to local agencies that builds on the Compass Blueprint's vision and addresses important regional issues such as housing, traffic/transportation, water, air quality, and energy throughout the six-county area. The Regional Comprehensive Plan includes goals, outcomes, and policies that address regional compliance with AB 32, as well as other state and federal regulations, including green building standards, regional fossil fuel consumption, and other CARB measures discussed above.

Lake Elsinore is also located within the South Coast Air Basin. The South Coast Air Quality Management District (SCAQMD) is the agency principally responsible for comprehensive air pollution control in the Basin. In 2008, SCAQMD released its *Draft Greenhouse Gas Guidance Document* to provide emissions analysis guidance to local jurisdictions within the Basin. This document proposes a tiered approach, whereby the level of detail and refinement needed to determine significance increases with a project's total GHG emissions. The tiered approach defines projects that are exempt from conducting GHG analyses under CEQA and projects that are within a GHG emissions reduction plan, or climate action plan, as less than significant. In September 2010, SCAQMD staff proposed to change the Tier 4 performance standards for plan-

level projects, recommending the use of a 6.6 MT $CO_2E$/SP target for 2020, as well as a year 2035 target of 4.1 MT $CO_2E$/SP.

The SCAQMD recently adopted Rule 2702, which creates a voluntary GHG reduction program within the District. Through this rule, the District will fund projects through contracts in response to requests for proposals or purchase reductions from other parties. Reductions obtained by the program may be purchased by persons for a variety of uses.

### 2.3.5 Local Government Roles and Responsibilities

AB 32 and its Scoping Plan identify local governments as essential partners in achieving California's emissions reduction goal. Local governments have broad influence and, in some cases, exclusive authority over activities that contribute to direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Decisions on how land is used, for example, will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas sectors. Although the Scoping Plan does not mandate specific emissions reduction requirements for local governments, it recommends that municipal agencies establish goals for municipal and community-wide emissions that parallel the state's effort and are consistent with the overall statewide emissions reduction target.

# 3.0 Greenhouse Gas Emissions Inventory

This chapter summarizes the results of the City's *Greenhouse Gas Emissions Inventory Report*. The report includes a baseline inventory of community-wide and local government (municipal) emissions for the 2008 calendar year (the most recent year for which there was comprehensive emissions data) and a business-as-usual forecast (i.e., under existing conditions without new emissions reduction measures) for the years 2020 and 2030. This information is intended to provide an understanding of Lake Elsinore's major sources of GHG emissions and to assist in developing appropriate emissions targets and reduction measures. Appendix A contains the complete Greenhouse Gas Emissions Inventory Report and supporting documentation.

## 3.1 Methodology

The baseline emissions inventory identifies the categories of activities, or sectors, within the City's jurisdictional boundary that emit GHGs and quantifies the baseline level of emissions from each of these sectors for the 2008 calendar year. The 2008 inventory includes two components: an analysis of community-wide emissions and an analysis of municipal emissions. The municipal inventory is a subset of the community-wide inventory, meaning that municipal emissions are included within the categories of the community-wide inventory. The community-wide inventory quantifies GHG emissions from activities in the energy (residential, commercial, and industrial uses), transportation, solid waste, and recreation sectors in Lake Elsinore. The municipal inventory quantifies emissions from local government-owned or -operated buildings and fleet vehicles, operations, and employee commute.

The GHG emissions forecast provides a business-as-usual estimate of how emissions will change in the years 2020 and 2030 if consumption trends and behavior continue as they did in 2008, absent of any new policies or actions that would reduce emissions. The forecast was performed by applying household, employment, and population growth rates to 2008 community-wide GHG emissions levels. The forecast estimates growth in GHG emissions that would occur through 2030, accounting for the full extent of the growth permitted under the 2030 General Plan, as shown in Table 3-1[1]. The forecast is based on the assumption that the number of drivers, electricity and natural gas use, and solid waste tonnage will increase over time in proportion to population, jobs, and households.

[1] In order to comply with CEQA, the GHG emissions forecast accounts for the full extent of the growth permitted by the General Plan Update (California Attorney General's Office, Climate Change, CEQA & General Plans, 2009). In reality, only a portion of this growth will occur by 2030.

**Table 3-1. General Plan Development Assumptions**

| | 2008 | 2020[1] | 2030 |
|---|---|---|---|
| Population (residents) | 49,528 | 108,866 | 209,755 |
| Employment (jobs) | 10,287 | 34,276 | 93,482 |
| Service Population (population + employment) | 59,815 | 143,142 | 303,237 |
| Housing (dwelling units) | 16,140 | 31,121 | 62,242 |

Development assumptions based on full buildout of General Plan within the City limits.
[1] 2020 population and employment is based on interpolation between 2008 and 2030 data.

The baseline emissions inventory and forecast were calculated using the Clean Air and Climate Protection (CACP) software, developed by ICLEI (Local Governments for Sustainability). This software estimates GHG emissions – including carbon dioxide, methane, nitrous oxide, and fluorinated gases – derived from energy consumption, transportation, solid waste generation, and other sources of GHG emissions. The CACP software determines emissions using specific factors (or coefficients) according to the type of fuel used or type of solid waste. Emissions are aggregated and reported in terms of equivalent carbon dioxide units, or $CO_2e$ (refer to Section 2.1). Converting all emissions to carbon dioxide equivalent units allows for the consideration of different GHGs in comparable terms. For example, methane is 21 times more powerful than carbon dioxide in its capacity to trap heat, so one ton of methane emissions is equal to 21 tons of $CO_2e$.

Estimating the amount of GHGs generated by various activities requires using a variety of data sources and a diverse set of methodologies. Emissions inventories are, by nature, the reflection of the best available data and the most applicable methods at the time of their compilation. As such, the Lake Elsinore emissions inventory includes emissions sources that can be accurately accounted for using the most current emissions estimation methodology. As data and methodologies become more accessible and reliable, inventories, including Lake Elsinore's, can be updated and improved.

## 3.2 Community-Wide Emissions Inventory Results

In 2008, the community of Lake Elsinore emitted 506,727 metric tons (MT) $CO_2e$ from the energy (residential, commercial, and industrial uses), transportation, solid waste, and recreation sectors. This equates to 8.5 MT $CO_2e$ per resident or employee in the City's service population[2]. The transportation sector was the largest emitter of GHG emissions, producing 60.6% of the total community-wide emissions. Transportation-related emissions include emissions from gasoline and diesel vehicles traveling on local and state roads and highways. Gasoline vehicles accounted for 94.4% of transportation-related emissions, and diesel vehicles constituted the remaining 5.6% of emissions.

The energy sector (residential, commercial, and industrial uses) generated 32.4% of the total community-wide emissions. Energy-related emissions include emissions from the combustion of fossil fuels to produce electricity and natural gas consumed within Lake Elsinore. These emissions are primarily attributed to energy consumption that occurs in residential,

[2] In 2008, the City of Lake Elsinore's service population was 59,815, with 49,528 residents (California Department of Finance, 2010) and 10,287 jobs (SCAG, May 2009).

commercial, and industrial buildings. Residential uses accounted for 53.1% of the energy sector emissions; commercial uses accounted for 41.7% of the energy sector emissions; and industrial uses accounted for 5.3% of the energy sector emissions.

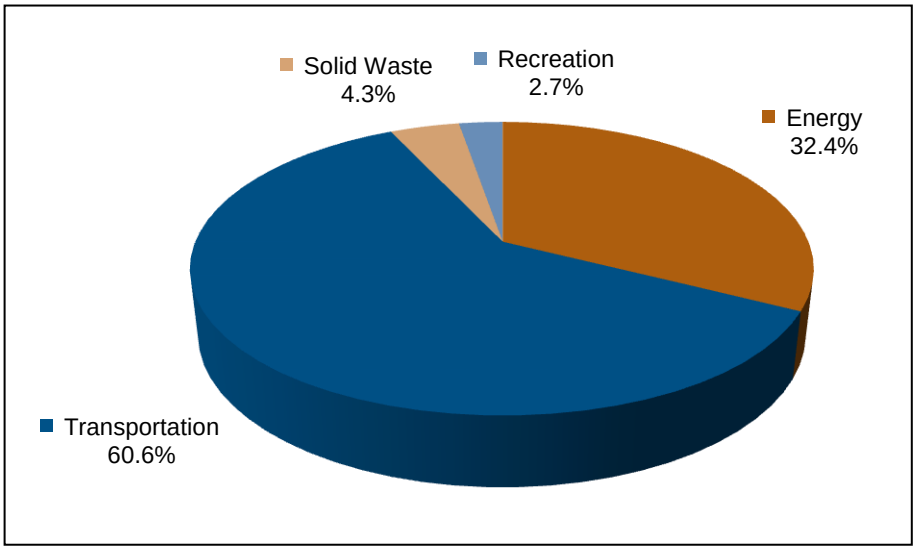
The solid waste sector contributed to 4.3% of the total community-wide emissions. This includes GHG emissions from organic waste sent to landfills. The recreation sector accounted for the remaining 2.7% of the total community-wide emissions. Emissions in this sector are attributed to fuel consumption from boats on Lake Elsinore. Table 3-2 and Figure 3-1 show community-wide GHG emissions from all major sectors and the percentage each contributed to the total community-wide emissions in 2008.

**Table 3-2. Community-Wide Emissions by Sector (2008)**

| Sector | MT $CO_2e$ | Percentage of Total |
|---|---|---|
| Energy | 164,311 | 32.4% |
| *Residential* | *87,196* | *17.2%* |
| *Commercial* | *68,461* | *13.5%* |
| *Industrial* | *8,654* | *1.7%* |
| Transportation | 306,955 | 60.6% |
| *Local Roads* | *85,871* | *16.9%* |
| *State Highways* | *221,084* | *43.6%* |
| Solid Waste | 21,622 | 4.3% |
| Recreation | 13,839 | 2.7% |
| **TOTAL** | **506,727** | **100.0%** |
| **Emissions per Service Population** | **8.5** | **100.0%** |

*Source: CACP Model output, 2011.*

**Figure 3-1**
**Community-Wide Emissions by Sector (2008)**



## 3.3 Municipal Emissions Inventory Results

In 2008, Lake Elsinore's municipal operations generated 4,324 MT $CO_2e$. This constitutes 0.9% of Lake Elsinore's total emissions. The majority of the City's municipal emissions are related to energy use for City-operated buildings and facilities, which represents 83.9% of the total emissions (refer to Table 3-3 and Figure 3-2 for municipal emissions by sector).

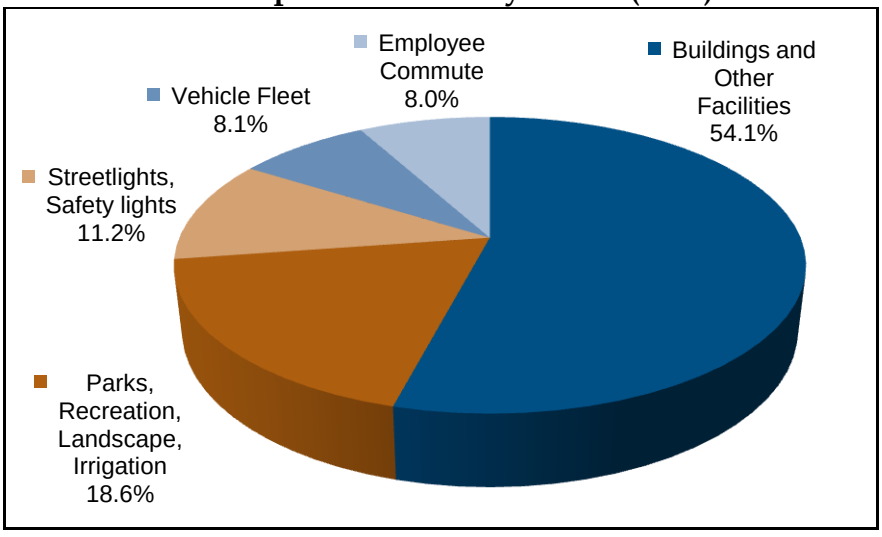
As a minor contributor to total community-wide emissions, actions to reduce municipal energy use will have a generally limited impact on Lake Elsinore's overall community emissions levels. However, municipal action can help reduce City government's operating costs and has important symbolic value demonstrating leadership that extends beyond the magnitude of emissions actually reduced.

**Table 3-3. Municipal Emissions by Sector (2008)**

| Sector | MT $CO_2e$ | Percentage of Total |
|---|---|---|
| Buildings and Facilities | 3,627 | 83.9% |
| *Buildings and Other Facilities* | *2,340* | *54.1%* |
| *Parks, Recreation, Landscape, Irrigation* | *803* | *18.6%* |
| *Streetlights, Safety lights* | *484* | *11.2%* |
| Transportation | 697 | 16.1% |
| *Vehicle Fleet* | *349* | *8.1%* |
| *Employee Commute* | *348* | *8.0%* |
| **TOTAL** | **4,324** | **100.0%** |

*Source: CACP Model Output, 2011.*

**Figure 3-2**
**Municipal Emissions by Sector (2008)**


Employee Commute 8.0%
Buildings and Other Facilities 54.1%
Vehicle Fleet 8.1%
Streetlights, Safety lights 11.2%
Parks, Recreation, Landscape, Irrigation 18.6%

## 3.4 Forecast Results

Under forecasted business-as-usual conditions, and accounting for the full extent of the growth permitted under the General Plan, Lake Elsinore's GHG emissions are projected to increase to 1,064,565 MT $CO_2e$ in 2020, which is equivalent to 7.4 MT $CO_2e$ per resident or employee in the City's service population, and to 2,028,819 MT $CO_2e$ in 2030, which equates to 6.7 MT $CO_2e$ per resident or employee in the City's service population. In reality, however, only a portion of the development permitted by the General Plan will occur by 2030; therefore, it is unlikely that Lake Elsinore's emissions will increase to this level. Table 3-4 shows the projected community-wide emissions by sector.

**Table 3-4. Community-Wide Emissions Forecast by Sector**

| Sector | MT $CO_2e$ | Percentage of Total |
|---|---|---|
| **Target Year 2020** | | |
| Energy | 350,595 | 32.9% |
| *Residential* | *189,877* | *17.8%* |
| *Commercial* | *149,079* | *14%* |
| *Industrial* | *11,639* | *1.1%* |
| Transportation | 636,472 | 59.8% |
| Solid Waste | 47,083 | 4.4% |
| Recreation | 30,415 | 2.9% |
| **2020 TOTAL** | **1,064,565** | **100.0%** |
| **2020 Emissions per Service Population** | **7.4** | **100.0%** |
| **Target Year 2030** | | |
| Energy | 663,216 | 32.7% |
| *Residential* | *363,175* | *17.9%* |
| *Commercial* | *285,142* | *14.1%* |
| *Industrial* | *14,899* | *0.7%* |
| Transportation | 1,217,373 | 60% |
| Solid Waste | 90,056 | 4.4% |
| Recreation | 58,174 | 2.9% |
| **2030 TOTAL** | **2,028,819** | **100.0%** |
| **2030 Emissions per Service Population** | **6.7** | **100.0%** |

*Source: CACP Model output, 2011.*

# 4.0 Emissions Reduction Targets

This chapter discusses the City of Lake Elsinore's community-wide GHG emissions targets for 2020 (the AB 32 target year) and 2030 (the General Plan horizon year) and their consistency with AB 32 and Executive Order S-3-05. The targets described herein represent quantitative levels of GHG emissions reductions required to demonstrate consistency with AB 32 and Executive Order S-3-05 and mitigate Lake Elsinore's community-wide GHG emissions impact.

## 4.1 Target Development

The City has made considerable effort to select emissions reduction targets that are both ambitious and practical, and consistent with AB 32 and Executive Order S-3-05. For local governments, there are several types of targets that may be supported by substantial evidence and be consistent with AB 32 and Executive Order S-3-05, such as a performance standard or an efficiency metric (e.g., emissions per capita or service population) (CAPCOA, 2008). For example, the AB 32 Scoping Plan encourages local governments to adopt a reduction target that parallels the state targets of 1990 levels (426,600,000 MT $CO_2e$) by 2020 and 80% below 1990 levels (85,320,000 MT $CO_2e$) by 2050; however, given that identifying 1990 emissions levels can be difficult for some local governments, a reduction of approximately 15% below 2005 levels is given as a rough equivalency where a local government has grown roughly at the same rate as the State (1% per year). For local governments that are not growing at the same rate as the State, such as Lake Elsinore, an efficiency based target may be more appropriate because it establishes the GHG emissions rate that would accommodate projected growth while allowing for consistency with the goals of AB 32 and Executive Order S-3-05 (State Attorney General's Office, 2010). In addition, an efficiency metric target based on the AB 32 and Executive Order S-3-05 emissions targets and statewide projected service population provides a clearly identified, quantifiable target that applies statewide.

The City selected efficiency-based targets for the years governed by the General Plan to reduce community-wide emissions to 6.6 MT $CO_2e$ per service population per year by 2020 (a 22.3% reduction from the 2008 rate of 8.5 MT $CO_2e$/SP) and to 4.4 MT $CO_2e$ per service population per year by 2030 (a 48.2% reduction from the 2008 rate of 8.5 MT $CO_2e$/SP). These efficiency-based targets represent the AB 32 and Executive Order S-3-05 targeted emissions levels for 2020 and 2030 on a per service population basis[1]. As shown in Table 4-1, they were derived by dividing the statewide AB 32 targeted emissions level for 2020 and statewide Executive Order S-3-05 targeted emissions level for 2030 by the 2020 and 2030 statewide service population respectively. Therefore, these targets represent the maximum quantity of emissions each resident and employee in the State of California could emit in 2020 and 2030 based on

[1] AB 32 sets the target of reducing statewide emissions to 1990 levels by 2020; Executive Order S-3-05 calls for the reduction of statewide emissions to 80% below 1990 levels by 2050. The State Attorney General's Office (2009) recommends that local governments establish targets for the years governed by the general plan that align with the AB 32 and Executive Order S-3-05 emissions reduction trajectory. The year 2020 target coincides with the AB 32 target year and the 2030 target aligns with California's long-term emissions trajectory identified in Executive Order S-3-05. 2030 statewide targeted emissions were extrapolated based on a linear projection from the 2020 target (1990 levels) to the 2050 target (80% below 1990 levels).

emissions levels necessary to achieve the statewide AB 32 and Executive Order S-3-05 GHG emissions reduction goals.

**Table 4-1. 2020 and 2030 Greenhouse Gas Efficiency Targets**

| | 2020 | 2030 |
|---|---|---|
| California's Total Emissions Target (MT $CO_2e$) [1] | 426,600,000 | 312,800,000 |
| California's Projected Population [2] | 44,135,923 | 49,240,891 |
| California's Projected Employment[3] | 20,194,661 | 22,087,585 |
| California's Projected SP (population + employment) | 64,330,584 | 71,328,476 |
| **Targeted Emissions per SP (MT $CO_2e$/SP)** | **6.6** | **4.4** |

SP = Service Population
[1] 2030 California Target: Extrapolated based on a linear projection from the 2020 Target (1990 levels) to the 2050 target (80% below 1990 levels)
[2] California Department of Finance projections, 2010
[3] California Employment, identified as a 0.9% annual growth rate in the Climate Change Scoping Plan.

The Bay Area Air Quality Management District (BAAQMD) was the first agency to adopt the 6.6 MT $CO_2e$/SP target which is applicable statewide and has received praise from the California Attorney General's Office (BAAQMD, June 2010; State Attorney General's Office, December 2009). It is specifically intended for use in evaluating the significance of GHG emissions from General Plans and their consistency with AB 32 (BAAQMD, June 2010). In addition, the South Coast Air Quality Management District (SCAQMD), in which Lake Elsinore is included, recommends the use of, and is proposing to adopt, the 6.6 MT $CO_2e$/SP target for 2020, as well as a year 2035 target of 4.1 MT $CO_2e$/SP for plan-level projects such as the CAP and General Plan (SCAQMD, Proposed Tier 4 Performance Standards, September 2010).

## 4.2 Meeting the Targets

In order to meet the statewide efficiency metric targets, the CAP must demonstrate that it can reduce community-wide emissions to 6.6 MT $CO_2e$/SP (or 944,737 MT $CO_2e$ total based on an estimated 2020 service population of 143,142) by 2020 and 4.4 MT $CO_2e$/SP (or 1,334,243 MT $CO_2e$ based on an estimated 2030 service population of 303,237) by 2030.

As described in Chapter 3.0, *Greenhouse Gas Emissions Inventory*, and shown in Table 4-2, Lake Elsinore's 2020 business-as-usual emissions are projected to be 1,064,565 MT $CO_2e$, or 7.4 MT $CO_2e$/SP and its 2030 business-as-usual emissions are projected to be 2,028,819 MT $CO_2e$, or 6.7 MT $CO_2e$/SP. Therefore to meet the 2020 and 2030 targets, Lake Elsinore will need to reduce its emissions by 0.8 MT $CO_2e$/SP (a total of 119,828 MT $CO_2e$) by 2020 and by 2.3 MT $CO_2e$/SP (a total of 694,576 MT $CO_2e$) by 2030. Chapter 5.0, *Strategies and Measures*, identifies the measures needed to reduce community-wide emissions by these quantities to meet the targets.

## Table 4-2. Lake Elsinore's Projected Greenhouse Gas Emissions and Required Reductions to Meet Targets

| | 2020 | 2030 |
|---|---|---|
| **General Plan Development Assumptions** | | |
| Population (residents) [a] | 108,866 | 209,755 |
| Employment (jobs) [b] | 34,276 | 93,482 |
| Service Population (population + employment) [c] | 143,142 | 303,237 |
| **Projected GHG Emissions** | | |
| Total Projected Emissions (MT $CO_2e$) [d] | 1,064,565 | 2,028,819 |
| Projected Emissions per Service Population (MT $CO_2e$/SP) [e] | 7.4 | 6.7 |
| **GHG Emissions Targets** | | |
| Targeted Emissions per Service Population (MT $CO_2e$/SP) [f] | 6.6 | 4.4 |
| Total Targeted Emissions (MT $CO_2e$) [g] | 944,737 | 1,334,243 |
| **Reduction Required to Meet Targets** | | |
| Targeted Reduction per Service Population (MT $CO_2e$/SP) [h] | 0.8 | 2.3 |
| Total Targeted Reduction (MT $CO_2e$) [i] | 119,828 | 694,576 |

[c] Population + employment (row a + b)
[d] From Chapter 3.0, *Greenhouse Gas Emissions Inventory*
[e] Total projected emissions divided by service population (row d ÷ c)
[f] From Table 4-1 (statewide targets)
[g] Service population multiplied by statewide efficiency targets (row c * f)
[h] Projected emissions per service population minus targeted emissions per service population (row e – f)
[I] Total projected emissions minus total targeted emissions (row d – g)

# 5.0 Strategies and Measures

The City of Lake Elsinore will meet its GHG emissions reduction targets through a combination of state-level measures and local strategies and measures, which are described in this chapter. As discussed in Chapter 4.0, *Targets*, to meet the 2020 emissions target of 6.6 MT $CO_2e$/SP, the City of Lake Elsinore would need to reduce projected business-as-usual emissions by 0.8 MT $CO_2e$/SP (or 119,828 MT $CO_2e$) and to meet the 2030 emissions target of 4.4 MT $CO_2e$/SP, the City of Lake Elsinore would need to reduce emissions by 2.3 MT $CO_2e$/SP (or 694,576 MT $CO_2e$).

## 5.1 Reductions from State-Level Measures

The AB 32 Scoping Plan identifies several state-level regulations and measures that are anticipated to reduce GHG emissions within Lake Elsinore. These measures, which are described below, were not accounted for in the State of California's or Lake Elsinore's emissions inventory or forecast; therefore, the CAP assumes credit for the portion of these statewide emissions reductions that would occur within the City. Several additional state-level measures are anticipated to reduce local emissions, such as the energy efficiency measures and SB 375; however, the CAP does not assume credit for them to avoid double counting with the local reduction measures. Table 5-1 summarizes the local reductions anticipated to occur from implementation of the state-level measures. Details on these calculations are provided in Appendix B.

**Assembly Bill 1493 (The Pavley Regulation).** Assembly Bill 1493 (Pavley) requires carmakers to reduce GHG emissions from new passenger cars and light trucks. CARB adopted regulations in September 2004 that create two phases of increasingly stringent standards for car manufacturers between 2009 and 2020. Pavley I took effect for model years starting in 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III Greenhouse Gas" will cover 2017 to 2025. The Scoping Plan anticipates that new vehicles sold in California will create an average of 19.7% fewer GHG emissions than current models statewide. Pavley I and II are expected to reduce transportation emissions within Lake Elsinore by 118,167 MT $CO_2e$ in 2020 and 225,199 MT $CO_2e$ in 2030.

**Low-Carbon Fuel Standard (LCFS).** The LCFS is a flexible performance standard designed to accelerate the availability and diversity of low-carbon fuels by taking into consideration the full life-cycle of GHG emissions. As part of the Scoping Plan, the LCFS is expected to reduce the carbon intensity of transportation fuels by 10%. However, a portion of the emission reductions required from the LCFS would be achieved over the lifecycle of transportation fuel production rather than from mobile-source emission factors. Based on CARB's estimate, the LCFS would result in a 7.2% reduction of mobile-source (passenger/light truck and heavy/medium duty vehicles) GHG emissions compared to 2020 business-as-usual conditions. The LCSF is expected to reduce Lake Elsinore's GHG emissions by approximately 46,841 MT $CO_2e$ in 2020 and 89,268 MT $CO_2e$ in 2030.

**Heavy/Medium Duty Vehicle Efficiency.** This measure requires all existing trucks and trailers to be retrofitted with the best available technology and/or CARB-approved technology. Technologies that reduce GHG emissions and improve the fuel efficiency of trucks may include

devices that reduce aerodynamic drag and rolling resistance. The requirements apply to California and out-of-state registered trucks that travel to California. This regulation is expected to result in a 2.9% reduction in GHG emissions from heavy and medium vehicles compared to 2020 business-as-usual conditions. This measure would reduce Lake Elsinore's GHG emissions by approximately 1,065 MT $CO_2e$ in 2020 and 2,029 MT $CO_2e$ in 2030.

**Passenger Vehicle Efficiency.** The Scoping Plan identifies several measures that would further reduce tailpipe GHG emissions from passenger vehicles by increasing vehicle efficiency. These measures require proper tire inflation and the use of solar-reflective automotive paint and window glazing (cool car standards). The Scoping Plan estimates that these regulations would result in a 2.8% reduction in GHG emissions from passenger vehicles compared to 2020 business-as-usual conditions, which is expected to reduce Lake Elsinore's GHG emissions by approximately 17,033 MT $CO_2e$ in 2020 and 32,461 MT $CO_2e$ in 2030.

**Renewable Portfolio Standard (Senate Bill 1078, Senate Bill 107, and Senate Bill 2X).** The State of California Renewable Portfolio Standard requires investor-owned utilities, electric service providers, and community choice aggregators to increase the portion of energy that comes from renewable sources to 20% by 2010 and 33% by 2020. This measure would reduce Lake Elsinore's GHG emissions by approximately 56,422 MT $CO_2e$ in 2020 and 107,527 MT $CO_2e$ in 2030.

**Senate Bill 375.** The Scoping Plan estimates a five million metric ton GHG emissions reduction statewide as a result of the regional targets for passenger vehicles and light trucks set by SB 375. Lake Elsinore is located within the Southern California Association of Governments (SCAG) region. SCAG's regional targets for passenger vehicles and light trucks include an 8% per capita reduction from 2005 levels by 2020 and a 13% per capita reduction from 2005 levels by 2035. For Lake Elsinore, this is equivalent to reducing transportation emissions to 5.7 MT $CO_2e$ per capita by 2020 and 5.4 MT $CO_2e$ per capita by 2035. Although SB 375 is expected to reduce transportation-related emissions, it is not included as a state-level credit in the CAP as the intent and implementation of SB 375 overlaps somewhat with the transportation and land use measures included in the CAP and would likely result in the double counting of emissions reductions. However, the local transportation and land use measures, identified in Section 5.2 below, will result in reductions that bring per capita emissions to 5.3 MT $CO_2e$ by 2020 and 5.2 MT $CO_2e$ by 2030, thereby exceeding these targets.

As shown in Table 5-1, state-level measures are expected to reduce emissions in Lake Elsinore by approximately 22.5%, which translates to approximately 239,528 MT $CO_2e$ (or 1.7 MT $CO_2e$/SP) in 2020 and to approximately 456,484 MT $CO_2e$ (or 1.5 MT $CO_2e$/SP) in 2030. City-led actions, described below, are designed to achieve additional emissions reductions necessary to accomplish the City's GHG reduction targets.

**Table 5-1. Reductions from State-Level Measures in Lake Elsinore**

| State Measures from Scoping Plan | End Use Sector | % Emission Reduction (Statewide) | Sector % of Lake Elsinore's Inventory | Lake Elsinore's Scaled % Reduction Credit[2] |
|---|---|---|---|---|
| AB 1493 (Pavley) | Transportation (passenger/ light truck) | 19.7% | 56.3% | 11.1% |
| Low Carbon Fuel Standards | Transportation (passenger/ light truck) | 7.2% | 56.3% | 4.1% |
| Low Carbon Fuel Standards | Transportation (heavy/medium duty) | 7.2% | 3.5% | 0.3% |
| Heavy/Medium Duty Efficiency | Transportation | 2.9% | 3.5% | 0.1% |
| Passenger Vehicle Efficiency | Transportation | 2.8% | 56.3% | 1.6% |
| Renewables Portfolio Standard[1] | Energy | 21.0% | 25.2% | 5.3% |
| **TOTAL Reduction from State Regulations in Lake Elsinore** | | | | **22.5%** |

[1]The Renewables Portfolio Standard requires the renewable energy portion of the retail electricity portfolio to be 33% in 2020. In 2008, 17% of Southern California Edison's (Lake Elsinore's provider) qualified as renewable. This regulation is expected to result in an additional 16% reduction in emissions compared to 2020 business-as-usual conditions.
[2] % Emission Reduction Statewide was multiplied by the Sector % of Lake Elsinore's Inventory.
Source: Bay Area Air Quality Management District. California Environmental Quality Act Air Quality Guidelines; June 2010. CARB Scoping Plan, 2008.

## 5.2 Lake Elsinore's Strategies and Measures

This section describes the strategies and measures that the City of Lake Elsinore will implement to achieve its GHG emissions targets over the next two decades. The strategies and measures were selected to build on the policy direction set forth by the General Plan, capitalize on existing emission reduction opportunities within the community, and maintain consistency with the AB 32 Scoping Plan. They were developed taking into consideration existing community conditions, planned City capital improvements, policies and strategies of neighboring jurisdictions and regional agencies, regional and statewide best practices, costs and future savings, City staff input, public comments, and other information provided by residents and stakeholders during the public outreach process.

### Organization

The CAP strategies and measures are organized into four focus areas for analysis:

- Transportation and Land Use
- Energy

- Solid Waste
- Community Education and Outreach

Transportation and Land Use, Energy, and Solid Waste are the major emissions sectors in the City. Community Education and Outreach includes measures that would supplement and enhance the emissions reductions achieved in the Transportation and Land Use, Energy, and Solid Waste focus areas by providing residents, businesses, and community leaders with the necessary information, tools, and resources to enable them to take action.

Each focus area includes emissions reduction strategies with a series of implementation measures. Strategies represent the overarching ways to reduce GHG emissions in Lake Elsinore. Measures define the programs, policies, and projects that the City will implement to accomplish its reduction targets. Each measure has a description that provides important background information and describes the City's rationale and policy direction. Additionally, some descriptions provide detailed guidance that will be used in program implementation. Performance criteria, estimated implementation costs, savings, and the potential GHG emissions reductions are provided in a table following each measure description.

The GHG emissions reduction potential for each measure was calculated based on research data, findings, and guidance from public agencies, associations, and research institutes, such as ICLEI and the California Air Pollution Control Officers Association (CAPCOA), and required assumptions about the degree of implementation (detailed implementation assumptions are listed in the Appendix B).

## Monetary Costs and Savings

Each measure is presented with estimated initial costs and savings to the City, residents and businesses. Costs are generally presented as first year costs and account for the expense that would occur beyond conducting business-as-usual (i.e., without implementation of the CAP). Costs and savings are categorized as low, medium and high and correspond to dollar ranges shown in Table 5-2. Supporting information on costs and savings is provided in Appendix C.

**Table 5-2. Measure Cost and Savings**

| Cost/Savings Type | | Range |
|---|---|---|
| City Cost | Low: | $0 - $10,000 |
| | Medium: | $10,001 - $100,000 |
| | High: | $100,001 or greater |
| Private Cost | Low: | $0 - $1,000 |
| | Medium: | $1,001 - $5,000 |
| | High: | $5,001 or greater |
| Private Savings | Low: | $0 - $1,000 |
| | Medium: | $1,001 - $5,000 |
| | High: | $5,001 or greater |

## 5.2.1 Transportation and Land Use

Transportation-related emissions make up the biggest part (61%) of Lake Elsinore's 2008 GHG emissions inventory. The majority of these emissions result from the use of fuel (e.g., gasoline, diesel, etc.) to power cars and trucks within Lake Elsinore. Factors affecting transportation emissions include vehicle miles traveled, vehicle type, and the overall system infrastructure. In addition, these factors are directly influenced by the geographic distribution of people and places, especially the density of development and zoning. Therefore, this section also addresses land use.

The key to lower transportation-related emissions is to implement strategies that decrease vehicle miles traveled and encourage the replacement of traditional vehicles with fuel efficient and alternative energy vehicles. This involves providing more choices through greater access to alternative forms of transportation including transit, biking and walking; diversified land use patterns, and promoting development patterns where people can live, work and recreate without having to drive great distances. It also involves encouraging the use of zero- or low-emission vehicles over conventional automobiles.

**Co-Benefits of Transportation and Land Use Measures**

The transportation and land use measures in this section will not only help reduce GHG emissions, but also provide multiple benefits to the community. These include:

- Improved air quality
- Reduced traffic congestion
- Improved public health
- Reduced expenditures on fuel and automobiles
- More efficient utilization of existing infrastructure
- Increased community interaction
- Improved access to a variety of mobility options
- More diverse housing options focused on proximity to jobs, recreation, and services

### Strategy T-1: Increase bicycle, pedestrian and public transit travel

**Measure T-1.1:** **Safe Routes to School.** Continue to pursue and utilize grant funding when needed to construct safe pedestrian and bicycle routes within a two mile radius of schools where applicable.

The federal and state Safe Routes to School programs are intended to increase the number of children who walk or bicycle to school by funding projects and programs that improve safety and promote walking and bicycling within a collaborative community framework (California Department of Transportation, 2010). Funding may also be available through programs, such as the Community Development Block Grant and Measure A. Between 2009 and 2011, the City

installed sidewalks using Community Development Block Grant funds for students attending Lakeshore High School. In addition to reducing GHG emissions, safe routes to schools can provide important benefits to children and the community, including increasing physical activity, reducing traffic congestion, improving air quality, and enhancing neighborhood safety.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2020: 5% increase in children walking/biking to school<br>2030: 10% increase in children walking/biking to school | 2020: 288 MT $CO_2e$<br>2030: 576 MT $CO_2e$ | no new cost | none | low |

**Measure T-1.2:** **Pedestrian Infrastructure.** Through the development review process, require the installation of sidewalks along new and reconstructed streets. Also require new subdivisions and large developments to provide sidewalks or paths to internally link all uses where applicable and provide connections to neighborhood activity centers, major destinations, and transit facilities contiguous with the project site; implement through conditions of approval.

Designing that accommodates pedestrian needs rather than automobiles alone, can increase walking, particularly when emphasis is placed on connectivity, access and safety. As connectivity increases, travel distances decrease and route options increase, allowing more direct travel for pedestrians and bicyclists between destinations. Connectivity can apply both internally (streets within that area) and externally (connections with arterials and other neighborhoods). In addition, adequate sidewalks and crosswalks are essential. A smaller curb radius at intersections leaves a smaller distance for pedestrians to cross and forces turning vehicles to slow down, which increases pedestrian safety. Improved facilities and conditions for pedestrians can increase walking, resulting in a mode shift that reduces vehicle miles traveled and associated GHG emissions (Victoria Transport Policy Institute, 2010).

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2020: 1.5% of local trips shift from car to walking<br>2030: 3% of local trips shift from car to walking | 2020: 557 MT $CO_2e$<br>2030: 1,115 MT $CO_2e$<br>in combination with Measure T-1.3 and EO-1.4 | low | high | medium to high |

**Measure T-1.3:** **Street and Sidewalk Maintenance and Improvements.** Continue, through the Pavement Management and Curb, Gutter, and Sidewalk Repair programs, to preserve the pedestrian and bicycle circulation system by annually identifying and scheduling street and sidewalk improvement and maintenance projects.

The City's Pavement Management and Curb, Gutter, and Sidewalk Repair programs help to improve the existing pedestrian and bicycle network. Improved conditions for pedestrians and

bicyclists can increase walking and bicycling, and thereby reduce vehicle miles traveled and GHG emissions (Victoria Transport Policy Institute, 2010).

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2020: 1.5% of local trips shift from car to walking and bicycle<br>2030: 3% of local trips shift from car to walking and bicycle | Contributes to measures T-1.2 and 1.4 emissions reduction potential | no new cost | none | medium to high |

**Measure T-1.4:** **Bicycle Infrastructure.** Through the development review process, require new development, as applicable, to implement and connect to the network of Class I, II and III bikeways, trails and safety features identified in the General Plan, Bike Lane Master Plan, Trails Master Plan and Western Riverside County Non-Motorized Transportation plan; implement through conditions of approval. The City will also continue to pursue and utilize funding when needed to implement portions of these plans.

Bicycles are an efficient mode of transportation and are especially appropriate in reducing the number of short trips—up to five miles or so—which constitute more than half of all driving. Bicycles can also serve longer trips, on their own or in combination with public transit. Bicycle lanes on roadways and dedicated bicycle paths reduce the danger motor vehicles pose to bicyclists and encourage bicycle use. They also make bicycling faster and more pleasant. Well-maintained surfaces, good lighting, a feeling of security, and strategic locations constitute the elements of a good bicycle route network. Adding crossing signals specifically for bicycles at major intersections also helps to ensure efficient flow on the bicycle network as well as providing greater safety for bicyclists at dangerous road interfaces. A feedback process for bicyclists to recommend improvements such as filling potholes, removing cracks, and installing loop detectors is also important to increase bicycling (ICLEI, 2010). Improved facilities and conditions for bicyclists can increase bicycling, resulting in a mode shift that reduces motor vehicle miles traveled and associated GHG emissions (Victoria Transport Policy Institute, 2010).

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2020: 1.5% of local trips shift from car to bicycle<br>2030: 3% of local trips shift from car to bicycle | 2020: 2,230 MT $CO_2e$<br>2030: 4,460 MT $CO_2e$<br>in combination with measures T-1.3, 1.5 and EO-1.4 | low | high | medium to high |

**Measure T-1.5:** **Bicycle Parking Standards.** Through the development review process, enforce the following short-term and long-term bicycle parking standards for new non-residential development (consistent with 2010 California Green Building Code [CalGreen], Section 5.106.4), and implement through conditions of approval:

- *Short-Term Bicycle Parking:* If the project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitor entrance, readily visible to passers-by, for 5% of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack.
- *Long-Term Bicycle Parking*: For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5% of tenant-occupied motorized vehicle parking capacity, with a minimum of one space.

Despite improvements to the bikeway system, citizens may still be deterred from biking if there are not places to park or shower once they arrive to their destination. This measure, which the City adopted in 2011 as part of the CalGreen requirements, stipulates that new developments provide bicycle lockers, showers, and bike racks on site in order to incentivize bicycle commuting. By requiring these facilities, citizens will be encouraged to bicycle rather than drive, thus lowering the City's emissions.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2020: 1.5% of local trips shift from car to bicycle<br>2030: 3% of local trips shift from car to bicycle | Contributes to Measure T-1.4 emissions reduction potential | none | no new cost | medium to high |

**Measure T-1.6:** **Public Transit Incentives.** Coordinate with the Riverside Transit Agency to implement regional transit strategies in Lake Elsinore, expand transit routes, and provide public transit incentives to residents and employees, such as free or reduced-cost monthly transit passes.

Transit strategies, such as improving the safety, comfort, cost and convenience of transit can encourage higher levels of transit ridership and reduce personal automobile trips. Because buses carry many people in a single vehicle, they are more efficient than personal automobiles. Reducing vehicle-miles by encouraging more people to switch to riding the bus reduces emissions.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2015: Develop incentives program<br>2020: 1.5% shift from car to transit<br>2030: 3% shift from car to transit | 2020: 2,527 MT $CO_2e$<br>2030: 5,055 MT $CO_2e$ | low | none | low to medium |

## Strategy T-2: Manage vehicle parking

**Measure T-2.1:** **Designated Parking for Fuel-Efficient Vehicles.** Amend the Municipal Code to require that new non-residential development designate 10% of total parking spaces for any combination of low-emitting, fuel-efficient and carpool/vanpool vehicles (consistent with CalGreen Tier 1, Sections A5.106.5.1 and A5.106.5.3), and implement through conditions of approval. Parking stalls shall be marked "Clean Air Vehicle."

Revising the municipal code to require a certain percentage of parking to be dedicated to low-emitting, fuel-efficient, and carpool/vanpool vehicles would encourage the usage of such vehicles and thereby reduce associated GHG emissions. Ridesharing can be a cost effective transportation mode and reduce vehicle usage and associated emissions. Carpooling that makes use of existing vehicle seats that would otherwise travel empty have low incremental costs. Vanpooling with 6 or more passengers in a vehicle tends to have the lowest average cost per passenger-mile, since it carries more passengers per vehicle than a carpool, and does not require a professional driver or empty return-trips like conventional public transit services (Victoria Transport Policy Institute, 2010).

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Amend Municipal Code<br>2020: 5% of employees utilizing carpool/vanpool vehicles<br>2020: 10% of employees utilizing carpool/vanpool vehicles | 2020: 872 MT $CO_2e$<br>2030: 1,744 MT $CO_2e$<br>(reduction potential from hybrids and other fuel-efficient vehicles included in Measure T-5.1) | none | low to medium | medium |

## Strategy T-3: Increase in efficiency of land use patterns

**Measure T-3.1:** **Mixed-Use, High Density, Infill and Transit Oriented Development.** As part of the General Plan Update process, revise the Land Use Map and Municipal Code to allow for and/or increase the amount of mixed-use, high density, infill and transit oriented development. Mixed-use projects should be targeted in the Historic and Ballpark Districts, as well as other areas where services are within walking distance. High density projects should be located in urbanized areas adjacent to services and transportation. Update the Municipal Code for consistency between zoning regulations and General Plan land use designations.

Land use patterns affect the amount and type of travel that occurs in an area. Having different types of land uses near one another, such as with mixed-use development, can reduce vehicle miles traveled since trips between land use types are shorter and may be accommodated by non-auto modes of transport. Density (the number of people and businesses in a given area) and infill development also affects the distances that people must travel and increase the use of transit, walking and cycling (USEPA, 2007). In addition, locating higher density development near transit will facilitate the use of transit by people traveling to or from the development. The

use of transit and bicycles or walking results in reduced vehicle miles traveled (CAPCOA, 2010).

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Revise Land Use Map and Municipal Code<br>2020: 10% of new residences in mixed-use, high density, infill, or transit oriented development<br>2030: 20% of new residences in mixed-use, high density, infill, or transit oriented development | 2020: 27,107 MT $CO_2e$<br>2030: 54,215 MT $CO_2e$<br>in combination with measures T-3.2, T-3.3 and T-3.4 | none* | none | none |

*This cost would be included as part of the General Plan Update and Municipal Code update following adoption of the General Plan.

**Measure T-3.2:** **Mixed-Use, Infill, and Transit Oriented Development Incentives.** Identify and provide incentives to promote mixed-use, infill and transit oriented development, such as: a streamlined permitting process, less restrictive parking requirements, less restrictive height limits, lower permit fees and/or reduced impact fees.

A streamlined permitting process, less restrictive parking requirements, less restrictive height limits, lower permit fees and/or reduced impact fees would encourage and facilitate the implementation of mixed-use, infill and transit oriented development and thereby reduce GHG emissions by reducing vehicle miles traveled (ICLEI CAPPA, 2010).

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2015: Develop incentives program | Contributes to Measure T-3.1 emissions reduction potential | low * | none | medium |

*Costs may be reduced by drawing on incentives for mixed-use and high-density incentives identified in the Housing Element.

**Measure T-3.3:** **Density Bonus Incentive.** Amend the Municipal Code to allow for a Density Bonus Incentive for a residential project that is located within 1,500 feet of a regular bus stop or rapid transit system stop; is located within a quarter mile from a public park or community center; or is located within a half mile from school grounds/facilities open to the general public, a full-service grocery store, hospital, medical clinic, or pharmacy.

Placing residences close to key retail services, recreational facilities, schools, and bus stops increases the likelihood that an individual would walk or drive to such destinations, or use the bus as transportation, all of which would reduce vehicle miles traveled and associated GHG emissions (ICLEI CAPPA, 2010).

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Amend Municipal Code | Contributes to Measure T-3.1 reduction potential | none* | none | medium to high |

*This cost would be included as part of the General Plan Update and Municipal Code update following adoption of the General Plan.

**Measure T-3.4:** **Neighborhood Commercial Centers.** Identify potential neighborhood commercial center sites and rezone identified areas to Neighborhood Commercial as part of the General Plan Update.

Amend development regulations to accommodate small neighborhood shopping centers and individual retail establishments in residential neighborhoods. These centers could provide goods and services (e.g., dry cleaning, etc.) adjacent to existing residential neighborhoods, shortening the distance between residents and services and increasing the likelihood of walking and biking for errands, which would reduce overall emissions (ICLEI CAPPA, 2010).

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Revise Land Use Map and Municipal Code | Contributes to Measure T-3.1 reduction potential | none* | none | none |

*This cost would be included as part of the General Plan Update and Municipal Code update following adoption of the General Plan.

## Strategy T-4: Reduce trips

**Measure T-4.1:** **Commute Trip Reduction Program.** Institute a commute trip reduction program for employers with fewer than 100 employees (below the requirements of the existing Transportation Demand Management Program). Provide information, training, and incentives to encourage participation.

Telecommute work programs reduce the need for the use of vehicles to commute to work and thereby reduce associated emissions (ICLEI CAPPA, 2010).

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2015: Amend Municipal Code and provide training and incentives<br>2020: 10% of employees offered telecommuting or other commute trip reduction technique<br>2030: 20% of employees offered telecommuting or other commute trip reduction technique 2030 | 2020: 1,608 MT $CO_2e$<br>2030: 3,216 MT $CO_2e$ | low to medium | low | low to medium |

### Strategy T-5: Increase the use of low- and zero-emissions vehicles

**Measure T-5.1:** **Hybrid and Fuel-Efficient Vehicle Incentives.** Facilitate the voluntary replacement of inefficient vehicles with hybrids, plug-in electric, and other low- and zero-emissions vehicles by connecting residents and businesses with technical and financial assistance through the City's website.

Hybrid and other low- and zero-emissions vehicles use less gasoline, and thereby result in fewer GHG emissions. According to ICLEI and studies conducted by www.electricdrive.org, incentives can increase hybrid sales up to 50% over what they would otherwise be without incentives.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2015: Launch webpage<br>2020: 2.5% of vehicles replaced<br>2030: 5% of vehicles replaced | 2020: 26,924 MT $CO_2e$<br>2030: 53,848 MT $CO_2e$<br>in combination with Measure T-2.1 | low | medium | low to medium |

**Measure T-5.2:** **Municipal Fleet Vehicle Purchasing Policy.** Develop and adopt a low- and zero-emissions replacement/purchasing policy for new and replaced official City vehicles and equipment.

Purchasing standards would ensure that low-emission and zero-emission vehicles, including smaller, hybrid, plug-in hybrid, electric, compressed natural gas, biodiesel, and neighborhood electric vehicles are considered for purchasing before standard emission vehicles, and thereby reduce GHG emissions (ICLEI CAPPA, 2010).

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Adopt purchasing policy<br>2020: 7 vehicles replaced<br>2030: 15 vehicles replaced | 2020: 25 MT $CO_2e$<br>2030: 50 MT $CO_2e$ | low | none | none |

## 5.2.2 Energy

The energy sector accounts for 32% of Lake Elsinore's total 2008 GHG emissions. These emissions result from the combustion of fossil fuel, primarily coal and natural gas, which is used to heat, cool and provide power to residential, commercial and industrial buildings and other facilities. Factors affecting energy-related emissions in buildings include building design and the efficiency of technology and electronics in buildings. GHG emission reductions can be achieved both by changes to the energy supply (switching from a high-carbon to a low- or zero-carbon technology or fuel) and to demand (improving energy efficiency and reducing consumption in sectors where electricity is used).

| **Co-Benefits of Energy Measures** |
|---|
| In addition to reducing GHG emissions, the energy strategies and measures described in this section have the potential to provide other important benefits to the community. These include:<br>• Reduced utility costs<br>• Increased building re-sale value<br>• Reduced operational and maintenance costs<br>• Improved air quality<br>• Water conservation<br>• City beautification<br>• Municipal leadership |

## Strategy E-1: Reduce energy demand of new construction

**Measure E-1.1:** **Tree Planting Requirements.** Through the development review process, require new development to plant at minimum one 15-gallon non-deciduous, umbrella-form tree per 30 linear feet of boundary length near buildings, per the Municipal Code. Trees shall be planted in strategic locations around buildings or to shade pavement in parking lots and streets.

Trees provide a number of benefits to the community. Trees reduce energy use in buildings by providing shade and blocking wind. By reducing energy demand, trees and vegetation decrease the production of associated air pollution and GHG emissions. Researchers have found that planting deciduous trees or vines to the west is typically most effective for cooling a building, especially if they shade windows and part of the building's roof (USEPA, 2009). Trees can also store and absorb carbon dioxide (the most common GHG), remove air pollutants, help lower the risk of heat-related illnesses and deaths, improve stormwater control and water quality, reduce noise levels, create habitats, improve aesthetic qualities, and increase property values (USEPA, 2009). Between 2009 and 2011, 568 trees were planted based on this requirement, and the City planted 14 trees at the Dog Park. Lake Elsinore was also designated as "Tree City, USA" in 2010.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2020: 1,500 trees planted<br>2030: 3,000 trees planted | 2020: 378 MT $CO_2e$<br>2030: 757 MT $CO_2e$ | none | no new cost | low |

**Measure E-1.2:** **Cool Roof Requirements.** Amend the City Municipal Code to require new non-residential development to use roofing materials having solar reflectance, thermal emittance or Solar Reflectance Index (SRI)3 consistent with CalGreen Tier 1 values (Table A5.106.11.2.1), and implement through conditions of approval.

Cool roofs are most effective in hot, sunny climates similar to Lake Elsinore where winters do not reach freezing temperatures. A high solar reflectance and high thermal emittance are the

most important characteristics of a cool roof as they help to reflect sunlight and heat away from a building, reducing roof temperatures and the heat transferred into the building below. Together, these properties help roofs stay up to 50–60°F (28–33°C) cooler than conventional materials during peak summer weather (US EPA, 2009; California Energy Commission, 2010; Lawrence Berkeley National Laboratories, 2010). Because the buildings stay cooler, less energy is used for air conditioning and GHG emissions are reduced. Cool roofs deflect some desired heat gain during the winter. In general, though, cool roofs result in net energy savings, especially in areas where electricity prices are high (USEPA, 2009). In 2010, the City installed cool roofing at City Hall.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Adopt ordinance<br>2020 and 2030: 100% of new non-residential development | 2020: 5,934 MT $CO_2e$<br>2030: 11,868 MT $CO_2e$ | none | medium to high | high |

**Measure E-1.3:** **Energy Efficient Building Standards.** Adopt an ordinance requiring that all new construction exceed the California Energy Code requirements, based on the 2008 Energy Efficiency Standards by 15% (consistent with CalGreen Tier 1), through either the performance based or prescriptive approach described in the California Green Building Code; implement through conditions of approval. Alternately, a solar photovoltaic system and/or solar water heating may be used to assist in meeting all or a portion of the 15% requirement.

Title 24 of the California Code of Regulations is intended to increase the efficiency of buildings (California Department of Energy, 2010). The California Green Building Code (Part 11 of the California Building Standards Code in Title 24 of the California Code of Regulations), also known as the "CalGreen" standards, went into effect statewide on January 1, 2011. The CalGreen standards also provide the City an option to adopt energy efficiency standards that surpass basic State requirements. CalGreen contains two options for energy performance in new construction: Tier 1 requires a building's energy performance to exceed Title 24 requirements by 15%, while Tier 2 increases this standard to 30%.

The City will amend the Municipal Code to set an energy performance standard of 15% above Title 24 baseline for new residential and non-residential development (equivalent to Tier 1). The CalGreen standards are performance based, allowing the builder to achieve enhanced efficiency by incorporating a variety of building practices and materials; however, project applicants also have the option to follow CalGreen's prescriptive approach to achieve a 15% reduction. Southern California Edison along with the California Advanced Homes builder and buyer program, provides design assistance, education and financial support to help industry meet Tier 1 and 2 targets. Increasing the energy efficiency of new residential units and commercial buildings would not only reduce energy consumption in the community, and thereby reduce GHG emission, but could also considerably reduce homeowner and business energy bills. Because the stringency of future Title 24 Codes cannot be determined at this point, this measure should be reassessed when Title 24 Energy Codes are revised. If the Title 24 Energy Code is revised in order to meet residential zero net energy buildings goals by 2020, this measure will no longer be necessary.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Adopt ordinance<br>2020 and 2030: 100% of new development achieve 15% energy efficiency above Title 24 baseline | 2020: 41,302 MT $CO_2e$<br>2030: 82,604 MT $CO_2e$ | low | medium to high | low to medium |

## Strategy E-2: Increase energy efficiency of existing buildings

**Measure E-2.1:** **Energy Efficiency Upgrades and Retrofits.** Facilitate voluntary energy efficiency upgrades and retrofits in existing residential, commercial and industrial buildings by connecting residents and businesses with technical and financial assistance through the City website.

Many improvements can be applied to existing buildings through no- to low-cost investments to improve their energy efficiency, including using efficient light bulbs and fixtures, replacing appliances with more efficient ones, increasing insulation, replacing windows, and upgrading HVAC systems. The City will encourage efficiency improvements by leveraging Energy Upgrade California's and Southern California Edison's educational materials and online platforms to provide access to incentives, technical assistance, and qualified contractors. The City will also promote resources to link home and building owners to educational and financial resources, such as California Flex Your Power, Department of Energy Weatherization Assistance Program, County of Riverside Home Weatherization Program, EPA Portfolio Manager, and utility programs such as free energy audits and energy efficiency rebates.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2015: Launch webpage<br>2020: 20% of buildings complete an energy efficiency retrofit, with an average energy efficiency improvement of 20%<br>2030: 40% of buildings complete an energy efficiency retrofit, with an average energy efficiency improvement of 20% | 2020: 26,528 MT $CO_2e$<br>2030: 53,057 MT $CO_2e$ | low | medium to high | medium to high |

**Measure E-2.2:** **Green Business Certification Program.** Establish and administer a voluntary Green Business Certification Program to recognize businesses that voluntarily develop and implement energy conservation programs, including energy efficiency improvements, energy-efficient heating and cooling systems, and co-generation systems (e.g., solar energy arrays).

The green business certification program would be voluntary and would encourage businesses to go beyond operations regulations and conduct business in an environmental friendly manner that would reduce overall GHG emissions associated with that business. The green business program would address pollution reductions, energy savings, and recycling, and

waste reduction. Businesses would receive a checklist of measures, and implement a certain number of them to be certified. The incentive for businesses to participate is publicity resulting from their efforts, the ability to advertise as a certified green business, and a cost saving from the associated energy reduction.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2015: Launch green business program<br>2020: 500 businesses participating by 2020<br>2030: 1,000 businesses participating | Contributes to Measure E-2.1 reduction potential by 2,998 MT $CO_2e$ in 200 and 5,997 MT $CO_2e$ in 2030 | low | low to medium | medium |

**Measure E-2.3:** **Compact Fluorescent Light Bulb (CFL) Distribution Program.** Partner with Southern California Edison or a local business to sponsor a CFL distribution program; distribute at least 4,000 CFLs.

This program would encourage community members to use and purchase additional CFLs for their homes by holding promotional CFL giveaway days. CFLs use about 75% less energy than incandescent bulbs, according to the U.S. Department of Energy (2010). This would contribute to a reduction in GHG emissions through reduced energy consumption.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2015: 4,000 lights distributed | Contributes to Measure E-2.1 reduction potential by 60 MT $CO_2e$ | none to low | high | high |

### Strategy E-3: Increase energy efficiency of municipal buildings and facilities by 15% by 2020 and 20% by 2030

**Measure E-3.1:** **City HVACs.** Upgrade the HVAC systems at City facilities to reduce overall energy use.

Updating the HVAC systems at City facilities will improve efficiency and thereby reduce GHG emissions. The City has already completed upgrades to the HVAC systems at the Senior Center, and contracted periodic maintenance tune-ups. In addition, timers were installed on City air conditioning units.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2020: 100% of upgrades complete for at least 27,000 sf of buildings | 2020: 3 MT $CO_2e$ | low | none | none |

**Measure E-3.2:** **Energy Efficient Street and Traffic Signal Lights.** Work with Southern California Edison to replace existing high pressure sodium street lights

and traffic lights with high efficiency alternatives, such as Low Emitting Diode (LED) lights. Replace existing City owned traffic lights with LED lights. Require any new street and traffic lights to be LED and implement through conditions of approval.

Replacing existing high pressure sodium street lights and traffic with high efficiency alternatives, such as LED or induction lighting, would use substantially less electricity while producing the same amount of light, and therefore reduce the associated GHG emissions. Efficient lighting infrastructure is capable of reducing energy consumption and cost by 35-50% (ICLEI CAPPA, 2010). Between 2009 and 2011, the traffic signal lights within the City were replaced with LED lights.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2020: 50% replaced<br>2030: 100% replaced<br>100% of new street and traffic signal lights installed | 2020: 274 MT $CO_2e$<br>2030: 548 MT $CO_2e$ | none | high | high |

**Measure E-3.3:** **Street Light Automatic Daylighting Control Devices.** Work with Southern California Edison to install astronomical time-switch controls on street lights that automatically turns off the outdoor lighting when daylight is available.

Astronomical time-switch controls are devices that automatically turn off outdoor lighting when daylight is available (CalGreen, 2010). These controls eliminate daytime use, which can save considerable energy and reduce GHG emissions. This measure was completed between 2009 and 2011.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: 100% installation | 2015: 100 MT $CO_2e$ | none | none - complete | high |

**Measure: E-3.4:** **Energy Efficient Lights, Ballasts, and Occupancy Sensors at City Facilities.** Install energy efficient lights, ballasts and occupancy sensors at all City facilities.

Occupancy sensors reduce energy consumption by an average of 30% and associated GHG emissions by detecting activity in work areas and automatically turning lights on when people enter a room and off when people have left. When used properly, occupancy sensors can be a cost-effective way to reduce the operating time of lighting systems, resulting in energy savings and GHG emissions reductions. Between 2009 and 2011, the City completed this measure, for a total of 625 light fixtures, resulting in a 56% cost savings.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: 100% installation | 2015: 33 MT $CO_2e$ | none - complete | none | none |

**Measure E-3.5: Municipal Energy Efficiency Upgrades and Purchasing Standards.** Develop and adopt an energy efficient replacement/purchasing policy for City equipment and appliances (i.e., lights, computers, low-flow toilets and faucets, etc.).

The Municipal Energy Efficiency Purchasing Standards would require that new City equipment and appliances be energy efficient. This would reduce energy use and associated emissions. In addition, it would reduce operating costs and demonstrate leadership on energy-related issues in the community. The State's "Environmentally Preferable Purchasing Best Practices Manual" is one resource that provides purchasing officials with information on dozens of environmentally friendly products and services. Since 2009, the City has not only installed energy efficient lighting and associated devices, but also formed an Energy Conservation Committee; had Southern California Edison complete an energy audit for City facilities, parks and streets; purchased 80 automatic shut-off power strips; installed low-flow and waterless urinals at City facilities; installed low-flow faucets and showers at Diamond Stadium; and purchased an ENERGY STAR dishwasher for City Hall.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Adopt purchasing policy<br>2020: 15% energy reduction from purchases and upgrades (excluding lights)<br>2030: 20% energy reduction from purchases and upgrades (excluding lights) | 2020: 471 MT $CO_2e$<br>2030: 629 MT $CO_2e$ | low | none | none |

## Strategy E-4: Decrease water consumption

**Measure E-4.1: Landscaping Ordinance.** Through the development review process, enforce the City's Assembly Bill 1881 Landscaping Ordinance; implement through conditions of approval.

The Landscape Ordinance requires that landscaping is water efficient, and thereby consumes less energy and reduces emissions. Landscaping with native plants consumes less energy, lowers maintenance and costs, and reduces GHG emissions. The City adopted this ordinance in 2010.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2020: 100% of new residential development in 2020 and 5% of existing residences reduce outdoor water consumption by 20%<br>2030: 100% of new residential development in 2020 and 10% of existing residences reduce outdoor water consumption by 20% | 2020: 3,602 MT $CO_2e$<br>2030: 7,205 MT $CO_2e$ | none - complete | no new cost | low to medium |

**Measure E-4.2:** **Indoor Water Conservation Requirements.** Amend the City's Uniform Building Code to require development projects to reduce indoor water consumption by 30% (consistent with CalGreen Tier 1, Section A5.303.2.3.1), and implement through conditions of approval.

Project design features, such as low flow plumbing fixtures and appliances, or modifications in plumbing can reduce water consumption and associated energy demand and thereby reduce GHG emissions (ICLEI CAPPA, 2010). Presenting this measure in terms of performance criteria allows project applicants to select the most cost-effective or desirable ways to meet this target, rather than restricting them to prescribed technologies.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Amend Municipal Code<br>2020: 100% of new development in 2020 reduce indoor water consumption by 30%<br>2030: 100% of new development in 2030 reduce indoor water consumption by 30% | 2020: 6,940 MT $CO_2e$<br>2030: 13,881 MT $CO_2e$ | none | low to high | low to medium |

## Strategy E-5: Increase renewable energy opportunities

**Measure E-5.1:** **Renewable Energy Incentives.** Facilitate the voluntary installation of small-scale renewable energy systems, such as solar photovoltaic (PV) and solar hot water systems, by connecting residents and businesses with technical and financial assistance through the City website. The City will also revise the permit processes and fees as appropriate to remove barriers to and incentivize the installation of renewable energy systems, in accordance with applicable safety and environmental standards.

Renewable energy incentives and technical assistance programs could enable home and building owners to lower energy bills through low-cost investments in renewable energy technologies, which would reduce GHG emissions. To encourage participation, the City will leverage Energy Upgrade California's educational materials and online platform to provide access to incentives, technical assistance, and qualified contractors. The City will also promote

resources to link home and building owners to educational and financial resources, such as California Flex Your Power and Western Riverside Council of Government's AB 811 and 474 lending program for City residents. In addition, the City will offer technical assistance with building design and already offers a discounted permit fee for residential solar installations.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2015: Launch webpage<br>2020: 200 residential solar PV systems (avg 3 kW/residence) and 150 commercial solar PV systems (avg 10 kW/business) added; 5% of households install solar hot water<br>2030: 400 residential solar PV systems (avg 3 kW/residence) and 300 commercial PV systems (avg 10 kW/business) added; 10% of households install solar hot water | 2020: 3,884 MT $CO_2e$<br>2030: 7,769 MT $CO_2e$ | low | medium to high | medium to high |

## 5.2.3 Solid Waste

In 2008, the City of Lake Elsinore and the community generated approximately 83,710 tons of solid waste. Fifty percent of the solid waste was diverted from the local landfill through recycling and composting programs. The remaining 41,855 tons of solid waste was transported to nearby landfills, resulting in 21,622 MT $CO_2e$.

As solid waste decomposes in landfills, it releases methane, a GHG 21 times more potent than carbon dioxide. Two primary ways to reduce emissions associated with solid waste are to increase waste diversion (recycling) and reduce waste production.

| Co-Benefits of Solid Waste Measures |
|---|
| In addition to reducing GHG emissions, the solid waste strategies and measures described in this section have the potential to provide other important benefits to the community. These include:<br>• Improved air quality<br>• Municipal leadership |

### Strategy S-1: Increase solid waste diversion

**Measure S-1.1:** **Commercial Recycling.** Renegotiate the contract with the waste provider to require curbside recycling for all commercial land uses to divert 65% of commercial solid waste by 2020 and 75% of commercial solid waste by 2030.

According to the California Department of Resources Recycling and Recovery (2008), the commercial sector generates more than half of the solid waste in California (approximately 68 percent of waste disposed). In the past, the commercial sector has not been directly subject to

the requirements of the Integrated Waste Management Act of 1989 (AB 939), to divert waste from landfills. However, commercial recycling is now required under AB 32's Mandatory Commercial Recycling Measure (RW-3), which focuses on increased commercial waste diversion as a method to reduce GHG emissions. Western Riverside Council of Governments' (WRCOG) Solid Waste Cooperative Program addresses the needs of residents and businesses by providing pointers on how to set up a business recycling program, how and where to dispose of electronic waste, and resources for recycling construction and demolition materials. A mandatory curbside recycling program for Lake Elsinore businesses would reduce GHG emissions by reducing the amount of solid waste going to landfills.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Renegotiate contract<br>2020: 65% of commercial solid waste diverted<br>2030: 75% of commercial solid waste diverted | 2020: 6,366 MT $CO_2e$<br>2030: 7,074 MT $CO_2e$ | low | low | none |

**Measure S-1.2:** **Tiered Solid Waste Rate Structure.** Renegotiate the contract with the waste provider to implement a tiered rate structure for residential waste; divert 65% of residential solid waste by 2020 and 75% of residential solid waste by 2030.

The tiered rate structure for solid waste would charge residents based on the size of the trash container requested and therefore the amount of trash they discard; containers for green waste and recycling would be provided free of charge to the customer. This creates a direct economic incentive to generate less trash and recycle more. On average, communities with tiered rate structures see waste reductions of 15 to 28 percent (USEPA, 2010). The tiered rate structure would reduce GHG emissions as waste is diverted from landfills.

| Performance Criteria | Emissions Reduction Potential* | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Renegotiate contract<br>2020: 65% of residential solid waste diverted<br>2030: 75% of residential solid waste diverted | 2020: 1,696 MT $CO_2e$<br>2030: 1,884 MT $CO_2e$ | low | low | low |

*Based on the incremental change from 50% to 65-75%

**Measure S-1.3:** **Recycling Receptacles at City Buildings and Facilities.** Provide recycling containers at all City buildings and facilities and to all employees; divert 65% of municipal solid waste by 2020 and 75% of municipal solid waste by 2030.

This measure will reduce GHG emissions by increasing solid waste diversion and demonstrate community-wide leadership. Since 2009, the City has already provided recycling bins at all City facilities.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Provide recycling containers<br>2020: 65% of municipal solid waste diverted<br>2030: 75% of municipal solid waste diverted | 2020: <1 MT $CO_2e$<br>2030: <1 MT $CO_2e$ | low | none | none |

**Measure S-1.4:** **Construction and Demolition Waste Diversion.** Amend the Municipal Code to require development projects to divert, recycle or salvage at least 65% of nonhazardous construction and demolition debris generated at the site by 2020 (consistent with CalGreen Tier 1, Section A5.408.3.1). Require all construction and demolition projects to be accompanied by a waste management plan for the project and a copy of the completed waste management report shall be provided upon completion.

Construction generates a large amount of waste that can be sorted, recycled and diverted from landfills (ICLEI CAPPA, 2010). Increasing the City's diversion rate beyond the 50% required by the state would further reduce the amount of waste directed to landfills and thereby reduce GHG emissions. WRCOG's Solid Waste Cooperative Program provides resources for recycling construction and demolition materials to facilitate the success measure.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Amend Municipal Code and coordinate with waste hauler<br>2020: 65% of construction and demolition waste diverted | 2020: 152 MT $CO_2e$ | low | medium | none |

**Measure S-1.5:** **Green Waste Program.** Renegotiate the contract with the waste provider to provide green waste bins that split off the green waste from the trash stream.

Green waste generates a large amount of waste that can be diverted from landfills (CalRecycle, 2010). Increasing the City's diversion rate beyond the 50% required by the state would further reduce the amount of waste directed to landfills and thereby reduce GHG emissions. The City recently completed this measure in coordination with the City's trash hauler, CR&R.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2020: 65% of green waste diverted<br>2030: 75% of green waste diverted | 2020: 212 MT $CO_2e$<br>2030: 414 MT $CO_2e$ | none - complete | none | none |

### Strategy S-2: Decrease solid waste generated

**Measure S-2.1:** **Municipal Purchasing Policy.** Develop and adopt an Environmentally Preferable Purchasing policy for municipal operations.

Environmentally Preferable Purchasing (EPP) refers to buying products and services with reduced effects on human health and the environment. The EPP policy would institute practices that reduce waste by increasing product efficiency and effectiveness; require the purchase of products that include recycled content, are durable and long-lasting; and require the purchase of products that minimize environmental impacts.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2020: 75% of purchased products environmentally preferable<br>2030: 85% of purchased products environmentally preferable | 2020 and 2030: <1 MT $CO_2e$ | low | none | none |

## 5.2.4 Community Education and Outreach

Community involvement, public education and outreach are critical to promote individual measures that help reduce GHG emissions and maximize their effect. The City can encourage community members to take the steps necessary to reduce their contribution of GHG emissions by providing information about climate change science and potential impacts, and by connecting residents and businesses with information, tools, and resources to help them take action. Effective public participation will increase the likelihood that the GHG reduction measures identified in this plan achieve estimated participation rates.

| Co-Benefits of Community Education and Outreach Measures |
|---|
| In addition to reducing GHG emissions, the solid waste strategies and measures described in this section have the potential to provide other important benefits to the community. These include:<br>• Municipal leadership<br>• Increase community interaction<br>• Support all other GHG reduction measures |

### Strategy EO-1: Expand Community Education and Outreach

**Measure EO-1.1:** **Green Page on City's Website.** Create and regularly maintain a "green" page on the City's website to provide educational materials, and information of incentive programs and rebates.

The "green" page would provide educational materials, and information of incentive programs and rebates (ICLEI CAPPA, 2010). This would ensure that residents of the community are aware of the available programs, which would facilitate participation and implementation of GHG reduction efforts (ICLEI CAPPA, 2010).

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2015: Launch webpage; update every six months | Contributes to transportation, energy, and solid waste measures | low | none | none |

**Measure EO-1.2: Quarterly Brochure with Specific Emissions Reduction Information.** Create a quarterly brochure to distribute to residents and business providing educational information, information about what the City is doing to reduce emissions, ways for the public and businesses to reduce emissions, and incentive and rebate programs. Each quarter will cover a different topic. Topics include Energy Efficiency and Conservation, Alternative Energy, Transportation, Solid Waste Reduction and Recycling, Water Conservation, Mixed-Use and Transit Oriented Development, and Green Building. A portion of each brochure can be used to recognize and publicize actions that local businesses have taken and new developments that implement CAP actions for the particular topic. Distribute via email and at City counters.

Brochures would provide educational materials and information regarding incentive programs and rebates. This would ensure that residents and businesses of the community are aware of the available programs, which would facilitate participation and implementation of GHG reduction efforts. In 2010, the City sent out 801 brochures for Southern California Edison's Direct Install Program for Small and Medium Businesses which offered free energy assessments and energy efficient improvements. Of the 801 recipients, 43 responded favorably and 7 installations were completed.

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Initiate quarterly brochures and distribute to 10% of households/businesses | Contributes to transportation, energy, and solid waste measures | low | none | none |

**Measure EO-1.3: Themed Outreach.** Promote different methods for reducing GHG emissions throughout the year. Themes should be integrated into one event each year, as well as the City website, quarterly mailers, informational kiosks, and displays at City facilities. Example themes include: energy efficiency (e.g., partner with local contractors to hold workshops and demonstrations about home and office weatherization techniques and other ways that reduce energy consumption within a home or office) and alternative transportation (e.g., create a cycling and walking commute campaign, or hold cycling and walking events and activities, particularly on trails and cycling routes).

Residents can enact many simple measures in their homes to save energy: efficient appliances, insulation and sealing leaks, and/or turning the thermostat down in cold weather and up in hot weather. Outreach and education programs that offer information about and encourage conservation measures can tap into this potential. Incentives and prizes can increase interest in

conservation. An energy efficiency challenge is an effective way to motivate people to save energy. A challenge keeps track of personal energy reductions and awards a prize to the highest-saving individual (ICLEI CAPPA, 2010).

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2013: Initiate themed outreach<br>2020: 1 event per year through 2020 | Contributes to transportation, energy, and solid waste measures | medium | low | low |

**Measure EO-1.4: Multi-Modal Transportation Access Guide.** Produce a Multi-Modal Transportation Access Guide, which concisely describes and provides maps on how to reach a major destination in Lake Elsinore by foot, bicycle, transit, rideshare, etc. This information can be provided online, at City buildings, and major destinations in Lake Elsinore.

A Multi-Modal Transportation Access Guide would promote the use of alternative modes of transportation and a reduction in the use of vehicles, and thereby reduce associated GHG emissions (ICLEI CAPPA, 2010).

| Performance Criteria | Emissions Reduction Potential | City Cost | Private Cost | Private Savings |
|---|---|---|---|---|
| 2015: Publish guide by; distribute to 10% of households and publish online | Contributes to transportation, measures | low | none | none |

## 5.3 Greenhouse Gas Emissions Reduction Total

Table 5-3 provides a summary of the GHG reductions that would result from the state-level and local measures. Together, the measures would reduce emissions by 399,244 MT $CO_2e$ by 2020 and 768,105 MT $CO_2e$ by 2030. As a result, 2020 emissions would be 665,341 MT $CO_2e$ or 4.6 MT $CO_2e$/SP in 2020 and 1,263,966 MT $CO_2e$ or 4.2 MT $CO_2e$ in 2030, which reduces emissions beyond the required targets (see Table 5-4).

**Table 5-3. Summary of Greenhouse Gas Reduction Measure Potential**

| Measure Number and Title | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|
| **STATE-LEVEL MEASURES** | | |
| AB 1493 (Pavley) | 118,167 | 225,199 |
| Low Carbon Fuel Standards | 46,841 | 89,268 |
| Heavy/Medium Duty Efficiency | 1,065 | 2,029 |
| Passenger Vehicle Efficiency | 17,033 | 32,461 |
| Renewable Portfolio Standard | 56,422 | 107,527 |
| **TOTAL REDUCTIONS FROM STATE MEASURES** | **239,528** | **456,484** |

| Measure Number and Title | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|
| **LOCAL STRATEGIES AND MEASURES** | | |
| **Transportation and Land Use Measures** | | |
| **Strategy T-1: Increase bicycle, pedestrian and public transit travel** | | |
| Measure T-1.1: Safe Routes to School | 288 | 576 |
| Measure T-1.2: Pedestrian Infrastructure | 557 | 1,115 |
| Measure T-1.3: Street and Sidewalk Maintenance and Improvements | Contributes to T-1.2 and T-1.4 | Contributes to T-1.2 and T-1.4 |
| Measure T-1.4: Bicycle Infrastructure | 2,230 | 4,460 |
| Measure T-1.5: Bicycle Parking Standards | Contributes to T-1.4 | Contributes to T-1.4 |
| Measure T-1.6: Public Transit Incentives | 2,527 | 5,055 |
| **Strategy T-2: Manage vehicle parking** | | |
| Measure T-2.1: Designated Parking for Fuel-Efficient Vehicles | 872 | 1,744 |
| **Strategy T-3: Increase efficiency of land use patterns** | | |
| Measure T-3.1: Mixed-Use, High Density, Infill and Transit Oriented Development | 27,107 | 54,215 |
| Measure T-3.2: Mixed-Use, Infill, and Transit Oriented Development Incentives | Included in T-3.1 | Included in T-3.1 |
| Measure T-3.3: Density Bonus Incentive | Included in T-3.1 | Included in T-3.1 |
| Measure T-3.4: Neighborhood Commercial Centers | Included in T-3.1 | Included in T-3.1 |
| **Strategy T-4: Reduce trips** | | |
| Measure T-4.1: Commute Trip Reduction Program | 1,608 | 3,216 |
| **Strategy T-5: Increase the use of low- and zero-emissions vehicles** | | |
| Measure T-5.1: Hybrid and Fuel-Efficient Vehicle Incentives | 26,924 | 53,848 |
| Measure T-5.2: Municipal Fleet Vehicle Purchasing Policy | 25 | 50 |
| *Subtotal Transportation and Land Use* | *62,138* | *124,279* |
| **Energy Measures** | | |
| **Strategy E-1: Reduce energy demand of new construction** | | |
| Measure E-1.1: Tree Planting Requirements | 378 | 757 |
| Measure E-1.2: Cool Roof Requirements | 5,934 | 11,868 |
| Measure E-1.3: Energy Efficient Building Standards | 41,302 | 82,604 |
| **Strategy E-2: Increase energy efficiency of existing buildings** | | |
| Measure E-2.1: Energy Efficiency Upgrades and Retrofits | 26,528 | 53,057 |
| Measure E-2.2: Green Business Certification Program | Included in E-2.1 (2,998) | Included in E-2.1 (5,997) |
| Measure E-2.3: Compact Fluorescent Light Bulb (CFL) Distribution Program | Included in E-2.1 (60) | Included in E-2.1 (60) |
| **Strategy E-3: Increase in energy efficiency of municipal buildings and facilities by 15% by 2020 and 20% by 2030** | | |
| Measure E-3.1: City HVACs | 3 | 3 |
| Measure E-3.2: Energy Efficient Street and Traffic Signal Lights | 274 | 548 |

| Measure Number and Title | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|
| Measure E-3.3: Street Light Automatic Daylighting Control Devices | 100 | 100 |
| Measure: E-3.4: Energy Efficient Lights, Ballasts, and Occupancy Sensors at City Facilities | 33 | 33 |
| Measure E-3.5: Municipal Energy Efficiency Upgrades and Purchasing Standards | 471 | 629 |
| **Strategy E-4: Reduce water consumption** | | |
| Measure E-4.1: Landscaping Ordinance | 3,602 | 7,205 |
| Measure E-4.2: Indoor Water Conservation Requirements | 6,940 | 13,881 |
| **Strategy E-5: Increase the use of renewable energy** | | |
| Measure E-5.1: Renewable Energy Incentives | 3,566 | 7,132 |
| *Subtotal Energy* | *89,131* | *177,817* |
| **Solid Waste Measures** | | |
| **Strategy S-1: Increase solid waste diversion** | | |
| Measure S-1.1: Commercial Recycling | 6,366 | 7,074 |
| Measure S-1.2: Tiered Solid Waste Rate Structure | 1,696 | 1,884 |
| Measure S-1.3: Recycling Receptacles at City Buildings and Facilities | <1 | 1 |
| Measure S-1.4: Construction and Demolition Waste Diversion | 152 | 152 |
| Measure S-1.5: Green Waste Program | 212 | 414 |
| **Strategy S-2: Decrease waste generated** | | |
| Measure S-2.1: Municipal Purchasing Policy | <1 | <1 |
| *Subtotal Solid Waste* | *8,427* | *9,525* |
| **Public Education and Outreach Measures** | | |
| **Strategy EO-1: Expand Community Education and Outreach** | | |
| Measure EO-1.1: Green Page on City's Webpage | Contribute to transportation, energy, and solid waste measures. | |
| Measure EO-1.2: Quarterly Brochures with Emissions Reduction Information | Contribute to transportation, energy, and solid waste measures. | |
| Measure EO-1.3: Themed Events | Contribute to transportation, energy, and solid waste measures. | |
| Measure EO-1.4: Multi-Modal Transportation Access Guide | Contribute to transportation measures. | |
| *Subtotal Public Education and Outreach* | *Not applicable* | |
| **TOTAL REDUCTION FROM LOCAL MEASURES** | **159,696** | **311,621** |
| **TOTAL REDUCTION FROM STATE AND LOCAL MEASURES** | **399,224** | **768,105** |

**Table 5-4. Reductions Relative to Targets**

| | 2020 (MT $CO_2e$) | 2020 (MT $CO_2e$/ SP[1]) | 2030 (MT $CO_2e$) | 2030 (MT $CO_2e$/ SP) |
|---|---|---|---|---|
| Total Projected Business-as-Usual Emissions | 1,064,565 | 7.4 | 2,028,819 | 6.7 |
| Total Reduction from State and Local Measures | 399,224 | 2.8 | 768,105 | 2.5 |
| Total Projected Emissions with CAP | 665,341 | 4.6 | 1,260,714 | 4.2 |
| GHG Emissions Target | 944,737 | 6.6 | 1,334,243 | 4.4 |
| **Reductions Exceeding Target** | **279,396** | **2.0** | **73,529** | **0.2** |

[1] SP = Service Population; 2020 service population = 143,142; 2030 service population = 303,237

# 6.0 Implementation and Monitoring

Implementation and monitoring are essential elements of the CAP to ensure that Lake Elsinore achieves its emissions reduction targets. To achieve the GHG reductions described in the CAP, the strategies and measures must translate from policy language into on-the-ground results that can be measured. This chapter describes how the City will implement the CAP measures, and includes a schedule for measure implementation through 2030 and procedures to monitor the CAP's performance, and if necessary, alter or amend the plan to ensure that the plan remains effective and on track toward meeting its targets.

## 6.1 Implementation

Ensuring that the measures translate to on-the-ground results is critical to the success of the CAP. To facilitate this, the City will designate a staff member of a given department to be responsible for overseeing implementation and monitoring of the CAP. In addition, this section contains an implementation matrix with columns that reference key implementation details, including: measure description, implementation means, responsible department, status and implementation timeframe. The implementation timeframe separates measures into three phases for implementation: short-term (2011-2013), mid-term (2014-2020), and long-term (2021-2030). Phases indicate when implementation of the measure begins; the reduction effects and overall maintenance of the program will extend well beyond the identified phase. All reduction measures will begin implementation by 2021 (the start of the long-term phase). The cost of implementation for each measure is discussed in Chapter 5.0, and detailed in Appendix C.

**Table 6-1. Implementation Matrix**

| Measure | Implementation Means | Responsible Department | Measure Status | Implementation Timeframe | | |
|---|---|---|---|---|---|---|
| | | | | Short | Mid | Long |
| **Transportation and Land Use Measures** | | | | | | |
| **Measure T-1.1: Safe Routes to School**. Continue to pursue and utilize grant funding when needed to construct safe pedestrian and bicycle routes within a two mile radius of schools where applicable. | Policy | Planning and Public Works | Ongoing | ✓ | | |
| **Measure T-1.2: Pedestrian Infrastructure.** Through the development review process, require the installation of sidewalks along new and reconstructed streets. Also require new subdivisions and large developments to provide sidewalks or paths to internally link all uses where applicable and | Policy; Development Review Process/ Conditions of Approval | Planning, Public Works and Building | | ✓ | | |

| Measure | Implementation Means | Responsible Department | Measure Status | Implementation Timeframe | | |
|---|---|---|---|---|---|---|
| | | | | Short | Mid | Long |
| provide connections to neighborhood activity centers, major destinations, and transit facilities contiguous with the project site; implement through conditions of approval. | | | | | | |
| **Measure T-1.3: Street and Sidewalk Maintenance and Improvements.** Continue, through the Pavement Management and Curb, Gutter, and Sidewalk Repair programs, to preserve the pedestrian and bicycle circulation system by identifying and scheduling street and sidewalk improvement and maintenance projects. | Capital Improvement Program | Public Works | Ongoing | ✓ | | |
| **Measure T-1.4: Bicycle Infrastructure**. Through the development review process, require new development, as applicable, to implement and connect to the network of Class I, II and III bikeways, trails and safety features identified in the General Plan, Bike Lane Master Plan, Trails Master Plan and Western Riverside County Non-Motorized Transportation plan; implement through conditions of approval. The City will also continue to pursue and utilize funding when needed to implement portions of these plans. | Policy; Development Review Process/ Conditions of Approval | Planning, Public Works and Building | | ✓ | | |
| **Measure T-1.5: Bicycle Parking Standards**. Through the development review process, enforce the following short-term and long-term bicycle parking standards for new non-residential development (consistent with 2010 California Green Building Code [CalGreen], Section 5.106.4), and implement through conditions of approval:<br>• Short-Term Bicycle Parking: If | Development Review Process/ Conditions of Approval | Planning, Public Works and Building | | ✓ | | |

| Measure | Implementation Means | Responsible Department | Measure Status | Implementation Timeframe | | |
|---|---|---|---|---|---|---|
| | | | | Short | Mid | Long |
| the project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitor entrance, readily visible to passers-by, for 5% of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack.<br>• Long-Term Bicycle Parking: For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5% of tenant-occupied motorized vehicle parking capacity, with a minimum of one space. | | | | | | |
| **Measure T-1.6: Public Transit Incentives.** Coordinate with the Riverside Transit Agency to implement regional transit strategies in Lake Elsinore, expand transit routes, and provide public transit incentives to residents and employees, such as free or reduced-cost monthly transit passes. | Regional Coordination; Outreach & Incentives Program | Planning and Public Works | | | ✓ | |
| **Measure T-2.1: Designated Parking for Fuel-Efficient Vehicles.** Revise the Municipal Code to require that new non-residential development designate 10% of total parking spaces for any combination of low-emitting, fuel-efficient and carpool/vanpool vehicles (consistent with CalGreen Tier 1, Sections A5.106.5.1 and A5.106.5.3), and implement through conditions of approval. Parking stalls shall be marked "Clean Air Vehicle." | Municipal Code Amendment; Development Review Process/ Conditions of Approval | Planning, Public Works and Building | | ✓ | | |
| **Measure T-3.1: Mixed-Use, High Density, Infill and Transit Oriented Development.** As part of the General Plan Update process, revise the Land Use Map and Municipal Code to allow for | General Plan and Municipal Code Update | Planning | | ✓ | | |

| Measure | Implementation Means | Responsible Department | Measure Status | Implementation Timeframe | | |
|---|---|---|---|---|---|---|
| | | | | Short | Mid | Long |
| and/or increase the amount of mixed-use, high density, infill and transit oriented development. Mixed-use projects should be targeted in the Historic and Ballpark Districts, as well as other areas where services are within walking distance. High density projects should be located in urbanized areas adjacent to services and transportation. Update the Municipal Code for consistency between zoning regulations and General Plan land use designations. | | | | | | |
| **Measure T-3.2: Mixed-Use, Infill, and Transit Oriented Development Incentives**. Identify and provide incentives to promote mixed-use, infill and transit oriented development, such as: a streamlined permitting process, less restrictive parking requirements, less restrictive height limits, lower permit fees and/or reduced impact fees. | Outreach & Incentives Program | Planning and Public Works | | | ✓ | |
| **Measure T-3.3: Density Bonus Incentive.** Amend the Municipal Code to allow for a Density Bonus Incentive for a residential project that is located within 1,500 feet from a regular bus stop or rapid transit system stop; is located within a quarter mile from a public park or community center; or is located within a half mile from school grounds/facilities open to the general public, a full-service grocery store, hospital, medical clinic, or pharmacy. | General Plan and Municipal Code Update | Planning | Complete | ✓ | | |
| **Measure T-3.4: Neighborhood Commercial Centers**. Identify potential neighborhood commercial center sites and rezone identified areas to Neighborhood Commercial as part of the General Plan Update. | General Plan and Municipal Code Update | Planning | | ✓ | | |

| Measure | Implementation Means | Responsible Department | Measure Status | Implementation Timeframe | | |
|---|---|---|---|---|---|---|
| | | | | Short | Mid | Long |
| **Measure T-4.1: Commute Trip Reduction Program**. Institute a commute trip reduction program for employers with fewer than 100 employees (below the requirements of the existing Transportation Demand Management Program). Provide information, training, and incentives to encourage participation. | Municipal Code Amendment; Program | Planning | | | ✓ | |
| **Measure T-5.1: Hybrid and Fuel-Efficient Vehicle Incentives.** Facilitate the voluntary replacement of inefficient vehicles with hybrids, plug-in electric, and other low- and zero-emissions vehicles by connecting residents and businesses with technical and financial assistance through the City's website. | Outreach & Incentives Program | Planning and Public Works | | | ✓ | |
| **Measure T-5.2: Municipal Fleet Vehicle Purchasing Policy**. Develop and adopt a low- and zero-emissions replacement/purchasing policy for new and replaced official City vehicles and equipment. | Municipal Purchasing Policy | Public Works | 4 hybrids purchased | ✓ | | |
| **Energy Measures** | | | | | | |
| **Measure E-1.1: Tree Planting Program.** Through the development review process, require new development to plant at minimum one 15-gallon non-deciduous, umbrella-form tree per 30 linear feet of boundary length near buildings, per the Municipal Code. Trees shall be planted in strategic locations around buildings or to shade pavement in parking lots and streets. | City Ordinance; Development Review Process/ Conditions of Approval | Planning, Public Works, and Parks and Recreation | Complete | ✓ | | |
| **Measure E-1.2: Cool Roof Requirements.** Amend the City Municipal Code to require new non-residential development to use roofing materials having solar | City Ordinance; Development Review Process/ | Planning and Building | | ✓ | | |

| Measure | Implementation Means | Responsible Department | Measure Status | Implementation Timeframe | | |
|---|---|---|---|---|---|---|
| | | | | Short | Mid | Long |
| reflectance, thermal emittance or Solar Reflectance Index (SRI)3 consistent with CalGreen Tier 1 values (Table A5.106.11.2.1), and implement through conditions of approval. | Conditions of Approval | | | | | |
| **Measure E-1.3: Energy Efficient Building Standards.** Adopt an ordinance requiring that all new construction exceed the California Energy Code requirements, based on the 2008 Energy Efficiency Standards by 15% (consistent with CalGreen Tier 1), through either the performance based or prescriptive approach described in the California Green Building Code; implement through conditions of approval. Alternately, a solar photovoltaic system and/or solar water heating may be used to assist in meeting all or a portion of the 15% requirement. | City Ordinance; Development Review Process/ Conditions of Approval | Planning, Public Works and Building | | ✓ | | |
| **Measure E-2.1: Energy Efficiency Upgrades and Retrofits.** Facilitate voluntary energy efficiency upgrades and retrofits in existing residential, commercial and industrial buildings by connecting residents and businesses with technical and financial assistance through the City website. | Outreach & Incentives Program | Planning and Public Works | | | ✓ | |
| **Measure E-2.2: Green Business Certification Program**. Establish and administer a voluntary Green Business Certification Program to recognize businesses that voluntarily develop and implement energy conservation programs, including energy efficiency improvements, energy-efficient heating and cooling systems, and co-generation systems (e.g., solar energy arrays). | Outreach & Incentives Program | Planning and Public Works | | | ✓ | |

| Measure | Implementation Means | Responsible Department | Measure Status | Implementation Timeframe | | |
|---|---|---|---|---|---|---|
| | | | | Short | Mid | Long |
| **Measure E-2.3: Compact Fluorescent Light Bulb (CFL) Distribution Program**. Partner with Southern California Edison or a local business to sponsor a CFL distribution program; distribute at least 4,000 CFLs. | Program | Planning | | ✓ | | |
| **Measure E-3.1: City HVACs.** Upgrade the HVAC systems at City facilities to reduce overall energy use. | Renovation | Public Works | Senior Center HVACs completed and contracted periodic maintenance | ✓ | | |
| **Measure E-3.2: Energy Efficient Street and Traffic Signal Lights.** Work with Southern California Edison to replace existing high pressure sodium street lights and traffic lights with high efficiency alternatives, such as Low Emitting Diode (LED) lights. Replace existing City owned traffic lights with LED lights. Require any new street and traffic lights to be LED and implement through conditions of approval. | Rennovation; Municipal Code Amendment; Development Review Process/ Conditions of Approval | Public Works | Traffic signal lights complete; street lights incomplete | | ✓ | |
| **Measure E-3.3: Street Light Automatic Daylighting Control Devices.** Work with Southern California Edison to install astronomical time-switch controls on street lights that automatically turns off the outdoor lighting when daylight is available. | Renovation | Public Works | Complete | ✓ | | |
| **Measure: E-3.4: Energy Efficient Lights, Ballasts, and Occupancy Sensors at City Facilities.** Install energy efficient lights, ballasts and occupancy sensors at all City facilities. | Renovation | Public Works | Complete | ✓ | | |
| **Measure E-3.5: Municipal Energy Efficiency Upgrades and Purchasing Standards**. Develop and adopt an energy efficient replacement/purchasing policy for City equipment and appliances (i.e., lights, computers, | Municipal Purchasing Policy | Planning and Public Works | | ✓ | | |

| Measure | Implementation Means | Responsible Department | Measure Status | Implementation Timeframe | | |
|---|---|---|---|---|---|---|
| | | | | Short | Mid | Long |
| low-flow toilets and faucets, etc.). | | | | | | |
| **Measure E-4.1: Landscaping Ordinance**. Through the development review process, enforce the City's Assembly Bill 1881 Landscaping Ordinance; implement through conditions of approval. | City Ordinance; Development Review Process/ Conditions of Approval | Planning and Building | Complete | ✓ | | |
| **Measure E-4.2: Indoor Water Conservation Requirements.** Amend the City's Uniform Building Code to require development projects to reduce indoor water consumption by 30% (consistent with CalGreen Tier 1, Section A5.303.2.3.1), and implement through conditions of approval. | Municipal Code Amendment | Planning and Building | | ✓ | | |
| **Measure E-5.1: Renewable Energy Incentives**. Facilitate the voluntary installation of small-scale renewable energy systems, such as solar photovoltaic (PV) and solar hot water systems, by connecting residents and businesses with technical and financial assistance through the City website. The City will also revise the permit processes and fees as appropriate to remove barriers to and incentivize the installation of renewable energy systems, in accordance with applicable safety and environmental standards. | Outreach & Incentives Program | Planning and Building | Ongoing; discounted permitting fee in place | | ✓ | |
| **Solid Waste Measures** | | | | | | |
| **Measure S-1.1: Commercial Recycling.** Renegotiate the contract with the waste provider to require curbside recycling for all commercial land uses to divert 65% of commercial solid waste by 2020 and 75% of commercial solid waste by 2030. | Contract; Policy | Public Works | | ✓ | | ✓ |
| **Measure S-1.2: Tiered Solid Waste Rate Structure**. Renegotiate the contract with the | Contract | Public Works | | ✓ | | ✓ |

| Measure | Implementation Means | Responsible Department | Measure Status | Implementation Timeframe | | |
|---|---|---|---|---|---|---|
| | | | | Short | Mid | Long |
| waste provider to implement a tiered rate structure for residential waste; divert 65% of residential solid waste by 2020 and 75% of residential solid waste by 2030. | | | | | | |
| **Measure S-1.3: Recycling Receptacles at City Buildings and Facilities.** Provide recycling containers at all City buildings and facilities and to all employees; divert 65% of municipal solid waste by 2020 and 75% of municipal solid waste by 2030. | Program | Public Works | Complete | ✓ | | |
| **Measure S-1.4: Construction and Demolition Waste Diversion**. Amend the Municipal Code to require development projects to divert to recycle or salvage nonhazardous construction and demolition debris generated at the site, resulting in at least a 65% reduction by 2020 (consistent with CalGreen Tier 1, Section A5.408.3.1). Require all new projects to be accompanied by a waste management plan for the project and a copy of the completed waste management report shall be provided upon completion. | Contract; Municipal Code Amendment; Development Review Process/ Conditions of Approval | Planning and Building | | ✓ | | |
| **Measure S-1.5: Green Waste Program.** Renegotiate the contract with the waste provider to provide green waste bins that split off the green waste from the trash stream. | Program | Public Works | Complete | ✓ | | |
| **Measure S-2.1: Municipal Purchasing Policy.** Develop and adopt an Environmentally Preferable Purchasing policy for municipal operations. | Municipal Purchasing Policy | Planning and Public Works | | ✓ | | |

| Measure | Implementation Means | Responsible Department | Measure Status | Implementation Timeframe | | |
|---|---|---|---|---|---|---|
| | | | | Short | Mid | Long |
| **Community Education and Outreach Measures** | | | | | | |
| **Measure EO-1.1: Green Page on City's Website**. Create and regularly maintain a "green" page on the City's website to provide educational materials, and information of incentive programs and rebates. | Program | Planning and Public Works | | | ✓ | |
| **Measure EO-1.2: Quarterly Brochure with Specific Emissions Reduction Information.** Create a quarterly brochure to distribute to residents and business providing educational information, information about what the City is doing to reduce emissions, ways for the public and businesses to reduce emissions, and incentive and rebate programs. Each quarter will cover a different topic. Topics include Energy Efficiency and Conservation, Alternative Energy, Transportation, Solid Waste Reduction and Recycling, Water Conservation, Mixed-Use and Transit Oriented Development, and Green Building. A portion of each brochure can be used to recognize and publicize actions that local businesses have taken and new developments that implement CAP actions for the particular topic. Distribute via email and at City counters. | Program | Planning and Public Works | | | ✓ | |
| **Measure EO-1.3: Themed Outreach.** Promote different methods for reducing GHG emissions throughout the year. Themes should be integrated into one event each year, as well as the City website, quarterly mailers, informational kiosks, and displays at City facilities. Example themes include: energy efficiency (e.g., partner with local | Program | Planning and Public Works | | | ✓ | |

| Measure | Implementation Means | Responsible Department | Measure Status | Implementation Timeframe | | |
|---|---|---|---|---|---|---|
| | | | | Short | Mid | Long |
| contractors to hold workshops and demonstrations about home and office weatherization techniques and other ways that reduce energy consumption within a home or office) and alternative transportation (e.g., create a cycling and walking commute campaign, or hold cycling and walking events and activities, particularly on trails and cycling routes). | | | | | | |
| **Measure EO-1.4: Multi-Modal Transportation Access Guide**. Produce a Multi-Modal Transportation Access Guide, which concisely describes and provides maps on how to reach a major destination in Lake Elsinore by foot, bicycle, transit, rideshare, etc. This information can be provided online, at City buildings, and major destinations in Lake Elsinore. | Program | Public Works | | | ✓ | |

## 6.2 Monitoring

In order to ensure that the City is achieving its targeted level of emissions, City staff will monitor plan performance over time and alter or amend the plan if it is not achieving the proposed reduction targets. The City will use two important types of monitoring to evaluate performance: evaluation of the plan as a whole and evaluation of the individual measures.

### 6.2.1 Greenhouse Gas Emissions Inventory Update

To evaluate the performance of the CAP as a whole, the City will re-inventory community-wide GHG emissions every five years. Conducting periodic inventories will allow comparison to the 2008 baseline inventory and will demonstrate the CAP's ability to achieve proposed reduction targets. This will provide the best indication of the CAP's effectiveness and also allow actual growth to be reconciled with growth projected by the General Plan and CAP.

The Community Development Department will coordinate community-wide inventories every five years, beginning in 2015[1] to measure performance and progress towards achieving the emissions reduction targets. It will also enable the City to identify any need for adjustments to

[1] The baseline GHG emissions inventory of 2008 emissions was completed in 2010; therefore, the next inventory will be completed by December 31, 2015.

the emissions reduction measures if Lake Elsinore's GHG emissions are not in line with the targets.

Future updates to the inventory will be conducted using the same methodology – the ICLEI methodology – that was used to prepare the 2008 baseline inventory, or the closest comparable methodology available after the five-year period. This consistency ensures that the inventories can be used to compare program effectiveness over time. The baseline and future inventories must include emissions from the same sources, evaluate the same GHGs, and maintain the same physical boundaries, unless changes in baseline conditions, technologies or methodologies occur. As ICLEI improves calculation methodologies, the City may revise the 2008 baseline inventory to reflect these changes. Similarly, if the City includes more emissions sources in its emissions calculation, the 2008 baseline inventory would be revised to include the new emissions sources. In addition, the 2008 baseline inventory would be revised if the City's physical boundaries change.

### 6.2.2 Measure Implementation and Performance

Evaluating CAP measure performance requires monitoring the level of community participation and the GHG reduction potential. The performance indicators, provided within each quantified measure, identify the required action and level of participation or performance required to achieve the estimated level of GHG emissions reduction. By evaluating whether the implementation of a measure is on track, the City can identify successful measures and re-evaluate or replace under-performing ones.

City staff will evaluate measures every five years, identifying achievement of the performance indicators, participation rates (where applicable and including an assessment of how new development projects have been incorporating the measures), implementation costs, community benefits realized, remaining barriers to implementation, and recommendations for changes to the CAP. This evaluation may be submitted to the City Council in conjunction with the General Plan status report for that year as required by State Government Code Section 65400. In addition, measure review will include an assessment of the implementation of applicable Scoping Plan measures to determine if adjustments to the CAP must be made to account for any shortfalls in Scoping Plan implementation.

### 6.2.3 Amending the Climate Action Plan

It is possible that subsequent inventories will indicate that the CAP is not achieving established GHG reduction targets. Should this occur, the City will amend the document with revisions or additions to the emissions reduction measures. In addition, the City may periodically choose to modify the CAP to account for any advances in federal or state legislation that would result in substantially greater local reductions, or explore new opportunities for GHG emissions reductions as new technologies and information emerge.

# 7.0 References and Preparers

## 7.1 References

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Chauncy Tou, Customer Programs, Southern California Gas Company (electronic mail communication, March 29, 2010).

Gerald Wilson, Account Manager, Southern California Edison (electronic mail communication, March 31, 2010).

Ed Campos, Riverside County Solid Waste Division, CR&R, Incorporated (electronic mail communication, March 16, 2010).

Janill Richards, California Office of the Attorney General (personal communication, June 16, 2010).

Jessica Guzman, Planning Department, City of Lake Elsinore (electronic mail communications, March 2010).

## 7.3 List of Preparers

This Climate Action Plan was prepared by Rincon Consultants, Inc. under contract to the City of Lake Elsinore. Persons involved in research, analysis, report preparation, project management, and quality control include:

Joe Power, Principal-in-Charge
Shauna Callery, Project Manager
Robert Fitzroy, Associate Planner
Chris Bersbach, Associate Planner
Mathew Maddox, Associate Planner

# Glossary of Acronyms

| | |
|---|---|
| AB | Assembly Bill |
| CACP | Clean Air and Climate Protection Software |
| CAP | Climate Action Plan |
| CAPPA | Climate and Air Pollution Planning Assistant |
| CARB | California Air Resources Board |
| CEC | California Energy Commission |
| CEQA | California Environmental Equality Act |
| $CH_4$ | Methane |
| $CO_2$ | Carbon dioxide |
| $CO_2e$ | Carbon dioxide equivalent |
| EPA | U.S. Environmental Protection Agency |
| GHG | Greenhouse gas |
| HFC | Hydrofluorocarbons |
| HVAC | Heating, ventilating, and air conditioning |
| ICLEI | Local Governments for Sustainability |
| IPCC | Intergovernmental Panel on Climate Change |
| kWh | Kilowatt hours |
| LCFS | Low Carbon Fuel Standard |
| MMT | Million metric tons |
| $N_2O$ | Nitrous oxide |
| PPM | Parts per million |
| SCAG | Southern California Association of Governments |
| SCAQMD | South Coast Air Quality Management District |
| SB | Senate Bill |
| TOD | Transit oriented development |
| UNFCC | United Nations Framework Convention on Climate Change |
| USGBC | U.S. Green Building Council |
| VMT | Vehicle miles traveled |

*Global Warming Potential and $CO_2e$*

The global warming potential of a greenhouse gas is the potential of a gas or aerosol to trap heat in the atmosphere. Because greenhouse gases absorb different amounts of heat, a common reference gas ($CO_2$) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as "$CO_2$ equivalent," and is the amount of greenhouse gases emitted multiplied by its global warming potential. In this report $CO_2$ equivalent is measured in metric tons ($CO_2e$). Carbon dioxide has a global warming potential of one. By contrast, methane ($CH_4$) has a global warming potential of 21, meaning its global warming effect is 21 times greater than carbon dioxide on a molecule per molecule basis.

# Glossary of Terms

**Alternative Energy:** Energy derived from nontraditional sources (e.g., compressed natural gas, solar, hydroelectric, wind).

**Baseline:** The baseline serves as a reference point to assess changes in greenhouse gas emission from year to year.

**Bicycle Lane (Class II):** According to Caltrans' Highway Design Manual, Chapter 1000, a bicycle lane is a Class II Bikeway and provides a striped lane for one-way bicycle travel on a street or highway.

**Bicycle Path (Class I):** According to Caltrans' Highway Design Manual, Chapter 1000, a bicycle path is a Class I Bikeway and provides a completely separated right of way for the exclusive use of bicycles and pedestrians with cross flow by motorists is minimized.

**Bicycle Route (Class III):** According to Caltrans' Highway Design Manual, Chapter 1000, a bicycle route is a Class III Bikeway and provides for shared use with pedestrian or motor vehicle traffic.

**Business-as-Usual:** A scenario used for the projection of greenhouse gas emissions at a future date based on current technologies and regulatory requirements in absence of other reductions.

**Carbon Dioxide ($CO_2$):** A naturally occurring gas, and also a by-product of burning fossil fuels and biomass, as well as land-use changes and other industrial processes. It is the principal anthropogenic greenhouse gas that affects the Earth's radiative balance. It is the reference gas against which other greenhouse gases are measured and therefore has a Global Warming Potential of 1.

**Carbon Dioxide Equivalent ($CO_2E$):** This is a common unit for combining emissions of greenhouse gases with different levels of impact on climate change. It is a measure of the impact that each gas has on climate change and is expressed in terms of the potency of carbon dioxide. For carbon dioxide itself, emissions in tons of $CO_2$ and tons of $CO_2E$ are the same, whereas for nitrous oxide and methane, stronger greenhouse gases, one ton of emissions is equal to 310 tons and 21 tons of $CO_2E$ respectively.

**Carbon Sequestration:** The uptake and storage of carbon. Trees and plants, for example, absorb carbon dioxide, release the oxygen and store the carbon. Fossil fuels were at one time biomass and continue to store the carbon until burned.

**Carpool/Vanpool Vehicle:** Eligible vehicles are limited to any motor vehicle, other than a motor truck or truck tractor, designed for carrying more than 10 but not more than 15 persons including the driver, which is maintained and used primarily for the nonprofit work-related transportation of adults for the purposes of ridesharing.

**Chlorofluorocarbons (CFCs):** A family of inert, nontoxic, and easily liquefied chemicals used in refrigeration, air conditioning, packaging, insulation, or as solvents and aerosol propellants.

Because CFCs are not destroyed in the lower atmosphere, they drift into the upper atmosphere, where their chlorine components destroy ozone.

**Climate:** Climate in a narrow sense is usually defined as the "average weather," or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands of years. The classical period is three decades, as defined by the World Meteorological Organization. These quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system.

**Climate Action Plan:** A description of the measures and actions that a local government will take to reduce greenhouse gas emissions and achieve an emissions reduction target. Most plans include a description of existing and future year emissions; a reduction target; a set of measures, including performance standards, that will collectively achieve the target; and a mechanism to monitor the plan and require amendment if its not achieving specified levels. Interchangeable with Greenhouse Gas Reduction Plan.

**Climate Change:** Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from: natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun; natural processes within the climate system (e.g. changes in ocean circulation); human activities that change the atmosphere's composition (e.g. through burning fossil fuels) and the land surface (e.g. deforestation, reforestation, urbanization, desertification, etc.).

**Co-Benefit:** The benefits of policies that are implemented for various reasons at the same time – including climate change mitigation – acknowledging that most policies designed to address greenhouse gas mitigation also have other, often at least equally important, rationales (e.g., related to objectives of development, sustainability, and equity). The term co-impact is also used in a more generic sense to cover both the positive and negative side of the benefits.

**Connectivity:** A well connected circulation system with minimal physical barriers that provides continuous, safe, and convenient travel for all users of streets, roads, and highways.

**Corporate Average Fuel Economy (CAFE):** The CAFE standards were originally established by Congress for new automobiles, and later for light trucks, in Title V of the Motor Vehicle Information and Cost Savings Act with subsequent amendments. Under CAFE, automobile manufacturers are required by law to produce vehicle fleets with a composite sales-weighted fuel efficiency which cannot be lower than the CAFE standards in a given year. Standardized tests are used to rate the fuel economy of new vehicles.

**Emissions:** The release of a substance (usually a gas when referring to the subject of climate change) into the atmosphere.

**Emissions Factor:** A set of coefficients used to convert data provided on energy use and energy use reductions to emissions. These emission factors are the ratio of emissions of a particular pollutant (e.g., carbon dioxide) to the quantity of the fuel used (e.g., kilograms of coal). For example, when burned, 1 ton of coal = 2.071 tons of $CO_2$.

**Forecast Year:** Any future year in which predictions are made about emissions levels based on growth multipliers applied to the base year.

**Global Warming:** Global warming is an average increase in the temperature of the atmosphere near the Earth's surface and in the troposphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced. In common usage, "global warming" often refers to the warming that can occur as a result of increased emissions of greenhouse gases.

**Greenhouse Effect:** Trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. Some of the heat flowing back toward space from the Earth's surface is absorbed by water vapor, carbon dioxide, ozone, and several other gases in the atmosphere and then reradiated back toward the Earth's surface. If the atmospheric concentrations of these greenhouse gases rise, the average temperature of the lower atmosphere will gradually increase.

**Greenhouse Gas:** Any gas that absorbs infrared radiation in the atmosphere. Greenhouse gases include, but are not limited to, water vapor, carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), ozone ($O_3$), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride ($SF_6$).

**Heat Island Effect:** This phenomenon describes urban and suburban temperatures that are 2° to 10°F (1° to 6°C) warmer than nearby rural areas. As urban areas develop, buildings, roads, and other infrastructure replace open land and vegetation. Surfaces that were once permeable and moist become impermeable and dry. These changes cause urban regions to become warmer than their rural surroundings, forming an "island" of higher temperatures in the landscape.

**Heating, Ventilation, and Air Conditioning (HVAC):** Controls the ambient environment (temperature, humidity, air flow and air filtering) of a building and must be planned for and operated along with other data center components such as computing hardware, cabling, data storage, fire protection, physical security systems and power.

**Hydrofluorocarbons (HFCs):** Man-made compounds containing hydrogen, fluorine, and carbon, many of which have been developed as alternatives to ozone-depleting substances for industrial, commercial, and consumer products, that have a range of global warming potentials. HFCs do not have the potential to destroy stratospheric ozone, but they are still powerful greenhouse gases.

**Infill Site:** A site in an urbanized area that meets criteria defined in *Public Resources Code* Section 21061.3.

**Intergovernmental Panel on Climate Change (IPCC):** The IPCC was established jointly by the United Nations Environment Program and the World Meteorological Organization in 1988. The purpose of the IPCC is to assess information in the scientific and technical literature related to all significant components of the issue of climate change. The IPCC draws upon hundreds of the world's expert scientists as authors and thousands as expert reviewers. Leading experts on climate change and environmental, social, and economic sciences from some 60 nations have helped the IPCC to prepare periodic assessments of the scientific underpinnings for

understanding global climate change and its consequences. With its capacity for reporting on climate change, its consequences, and the viability of adaptation and mitigation measures, the IPCC is also looked to as the official advisory body to the world's governments on the state of the science of the climate change issue. For example, the IPCC organized the development of internationally accepted methods for conducting national greenhouse gas emission inventories.

**Low-Emitting and Fuel Efficient Vehicles:** Eligible vehicles are limited to the following:

1. Zero emission vehicle (ZEV), including neighborhood electric vehicles (NEV), partial zero emission vehicle (PZEV), advanced technology PZEV (AT ZEV) or CNG fueled (original equipment manufacturer only) regulated under *Health and Safety Code* section 43800 and CCR, Title 13, Sections 1961 and 1962.
2. High-efficiency vehicles, regulated by US EPA, bearing High Occupancy Vehicle (HOV) car pool lane stickers issued by the Department of Motor Vehicles.

**Methane ($CH_4$):** A hydrocarbon that is a greenhouse gas with a global warming potential most recently estimated at 23 times that of carbon dioxide ($CO_2$). Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

**Measures:** Any action taken to reduce emissions.

**Metric Ton (MT):** Common international measurement for the quantity of greenhouse gas emissions. A metric ton is equal to 2205 lbs or 1.1 short tons.

**Mixed-Use:** In a suburban context, a project that has at least three of the following on- or off-site within a ¼ mile radius: residential development, retail development, park, open space, or office. Mixed-use developments should encourage walking and other non-auto modes of transport from residential to office/commercial locations (and vice versa). The project should minimize the need for external trips by including services/facilities for day care, banking/ATM, restaurants, vehicle refueling, and shopping (CAPCOA, 2010).

**Natural Gas:** Underground deposits of gases consisting of 50 to 90 percent methane and small amounts of heavier gaseous hydrocarbon compounds such as propane and butane.

**Perfluorocarbons (PFCs):** Potent greenhouse gases that accumulate in the atmosphere and remain there for thousands of years. Aluminum production and semiconductor manufacture are the largest known man-made sources of perfluorocarbons.

**Recycling:** Collecting and reprocessing a resource so it can be used again. An example is collecting aluminum cans, melting them down, and using the aluminum to make new cans or other aluminum products.

**Sector:** A term used to describe emission inventory source categories for greenhouse gases based on broad economic sectors.

**Solar Photovoltaic:** A system that converts sunlight directly into electricity using cells made of silicon or other conductive materials. When sunlight hits the cells, a chemical reaction occurs, resulting in the release of electricity.

**Target Year:** The year by which the emissions reduction target should be achieved.

**Transit Oriented Development:** A moderate- to high-density development located within a 5-10 minute walk (or roughly ¼ mile) of a major transit stop, generally with a mix of residential, employment, and shopping opportunities. TOD encourages walking, bicycling, and transit use without excluding the automobile.

**Transportation Demand Management (TDM):** A strategy for reducing demand on the road system by reducing the number of vehicles using the roadways and/or increasing the number of persons per vehicle. For example, TDM attempts to reduce the number of persons who drive alone during the commute period and to increase the number in carpools, vanpools, buses or trains, or walking or biking.

**Vehicle-Miles Traveled (VMT):** One vehicle traveling the distance of one mile. Total vehicle miles is the aggregate mileage traveled by all vehicles. VMT is a key measure of overall street and highway use. Reducing VMT is often a major objective in efforts to reduce vehicular congestion and achieve air quality goals.

# Appendix A

*Greenhouse Gas Emissions Inventory Report*

*City of Lake Elsinore*

# Greenhouse Gas Emissions Inventory

February 2011

# City of Lake Elsinore
# Greenhouse Gas Emissions
# Inventory Report

*Prepared for:*

**City of Lake Elsinore**
130 South Main Street
Lake Elsinore, CA 92530

*Prepared by:*

**Rincon Consultants, Inc.**
180 N. Ashwood Avenue
Ventura, CA 93003

February 2011

Rincon Consultants, Inc. February 2011. City of Lake Elsinore Greenhouse Gas Emissions Inventory Report. Ventura, CA.

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**Appendix**
Clean Air and Climate Protection Report

# 1.0 Introduction

The City of Lake Elsinore is developing a Climate Action Plan to guide efforts to mitigate its impact on climate change and to maintain consistency with statewide greenhouse gas emissions reduction targets established by Assembly Bill (AB) 32 and Executive Order S-3-05. The City's objective is to develop a feasible plan to reduce its share of greenhouse gas emissions in a manner that strengthens the community, promotes economic vitality, and fosters a healthy environment. Developing such a plan involves five steps:

1. Conduct a greenhouse gas emissions inventory and forecast
2. Establish an emissions reduction target
3. Develop strategies and measures to meet the target
4. Implement the greenhouse gas emissions reduction measures
5. Monitor and verify emissions reductions

This *Greenhouse Gas Emissions Inventory Report* summarizes the results of the first step. The report includes a baseline inventory of greenhouse gases emitted from community-wide and City government activities within the City's jurisdictional boundary in 2008 and emission forecast for the years 2020 and 2030.

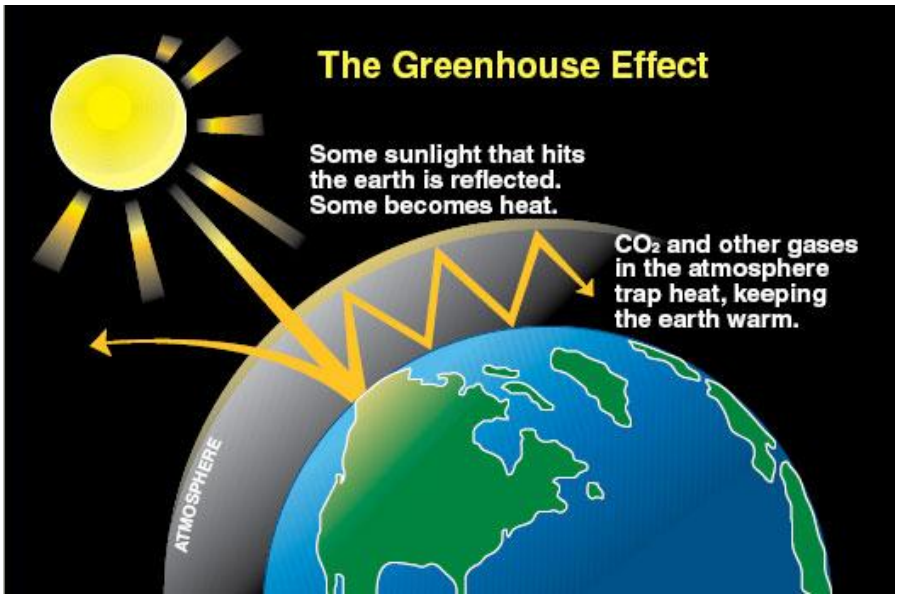
## 1.1 Purpose

The purpose of this inventory is to identify the categories of activities, or sectors, within the City of Lake Elsinore's jurisdictional boundary that emit greenhouse gases, quantify the baseline level of emissions from each of these activities for the 2008 calendar year, and forecast how emissions would increase in Lake Elsinore if no changes are made. This information provides an understanding of where the highest percentages of emissions in Lake Elsinore originate and where the greatest opportunities for emissions reductions exist. It also provides City decision-makers and the community with adequate information to inform policy decisions and provides a baseline against which future progress can be measured.

## 1.2 Greenhouse Gases and the Greenhouse Effect

The greenhouse effect is the rise in temperature that the earth experiences because certain gases in the atmosphere (i.e., water vapor, carbon dioxide, methane, nitrous oxide, and several other gases) trap the sun's energy. These gases are essential for regulating the earth's temperature. Without their natural heat trapping effect, the average temperature of the earth's surface would be about 60°F cooler. Because of how they warm the earth, these gases are referred to as "greenhouse gases." Figure 1-1 illustrates this process.

**Figure 1-1**
**The Greenhouse Effect**


The Greenhouse Effect
Some sunlight that hits the earth is reflected. Some becomes heat.
$CO_2$ and other gases in the atmosphere trap heat, keeping the earth warm.
ATMOSPHERE

A heat-trapping blanket of greenhouse gases in the atmosphere can cause potentially significant changes in the timing and length of the seasons, temperature, and the amount and frequency of precipitation.
*Source: Washington State Department of Ecology, 2010.*

Throughout history, the earth's climate has changed many times, with events ranging from ice ages to long periods of warmth. This rate of change has historically been incremental, taking place over the course of thousands of years, with greenhouse gas concentrations never higher than 300 parts per million (ppm). However, scientists have observed acceleration in the rate and magnitude of change over the past 150 years. Meanwhile, greenhouse gas concentrations have climbed to their highest point at over 350 ppm today, and are rising at about 2 ppm per year (IPCC, 2007). Although not all climate scientists agree on the specifics, the general scientific consensus is that greenhouse gas emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, are contributing to this accelerated warming trend.

The principal greenhouse gases that enter the atmosphere as a result of human activities are described below.

- **Carbon dioxide ($CO_2$)** is released into the atmosphere when organic compounds, such as fossil fuels (oil, natural gas and coal), solid waste and wood products are burned.
- **Methane ($CH_4$)** is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from agricultural practices, such as the raising of livestock, and by the decomposition of organic waste in landfills.
- **Nitrous oxide ($N_2O$)** is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- **Fluorinated gases** (i.e., hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride) are emitted from a variety of industrial processes. The main uses of fluorinated gases are for sprays, as blowing agents in foams and insulation materials, refrigerants in cooling and air

conditioning units, and in fire extinguishers. These gases are typically emitted in smaller quantities but are generally very strong greenhouse gases.

Each of the greenhouse gases listed above differs in its ability to absorb heat in the atmosphere, or in its "global warming potential." The global warming potential of the various greenhouse gases is based upon a comparison with carbon dioxide, which is set at one. For example, methane absorbs 21 times more heat per molecule than carbon dioxide and nitrous oxide absorbs 310 times more heat per molecule than carbon dioxide. Therefore, it is common practice to report emissions in terms of carbon dioxide equivalents ($CO_2E$) by multiplying the amount of each greenhouse gas by its global warming potential. Table 1-1 shows the global warming potentials for the most abundant six greenhouse gases.

**Table 1-1. Global Warming Potentials of Greenhouse Gases for a 100-Year Period**

| Greenhouse Gas | Global Warming Potential |
|---|---|
| Carbon Dioxide ($CO_2$) | 1 |
| Methane ($CH_4$) | 21 |
| Nitrous Oxide ($N_2O$) | 310 |
| Hydroflourocarbons (HFCs) | 140-11,700 |
| Perflourocarbons (PFCs) | 6,500-9,200 |
| Sulfur Hexaflouride ($SF_6$) | 23,900 |

*Source: Intergovernmental Panel on Climate Change, 1995.*

## 1.3 Regulatory Setting

In an effort to stabilize greenhouse gases and reduce impacts associated with climate change, international, federal, state, regional, and local agencies are taking action. These agencies work jointly and individually to address greenhouse gas emissions through legislation, regulations, planning, policy-making, education, and a variety of programs. This section summarizes these actions.

### 1.3.1 International

The United Nations leads international efforts to evaluate the impacts of climate change and to develop strategies to combat it. In 1992, United Nations convened to create the *United National Framework Convention on Climate Change* (UNFCC), an international treaty aimed at achieving "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."

Five years later, the UNFCC brought nations together again to draft the *Kyoto Protocol* (1997). The Protocol established commitments for industrialized nations to reduce their collective emissions of six greenhouse gases (carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons) to 5.2% below 1990 levels by 2012. The United States is a signatory of the Protocol but has not ratified it.

### 1.3.2 Federal

Although the United States has not ratified the Kyoto Protocol, the United States Supreme Court ruled in its decision in *Massachusetts et al. v. Environmental Protection Agency et al*. ([2007] 549 U.S. 05-1120), issued on April 2, 2007, that carbon dioxide is an air pollutant as defined under the federal Clean Air Act and that the United States Environmental Protection Agency (EPA) has the authority to and should regulate carbon dioxide and other greenhouse gases as pollutants. To date, the EPA has not developed a regulatory program for greenhouse gas emissions.

In 2007, the federal government passed legislation that was not directly intended to reduce emissions but will result in emissions reductions. The Energy Independence and Security Act of 2007 includes several key provisions that will increase energy efficiency and the availability of renewable energy, which will reduce greenhouse gas emissions as a result. First, the Act sets a Renewable Fuel Standard that requires fuel producers to use at least 36 billion gallons of biofuel by 2022. Second, it increased Corporate Average Fuel Economy (CAFE) Standards to require a minimum average fuel economy of 35 miles per gallon for the combined fleet of cars and light trucks by 2020. Third, the adopted bill includes a variety of new standards for lighting and for residential and commercial appliance equipment. The equipment includes residential refrigerators, freezers, refrigerator-freezers, metal halide lamps, and commercial walk-in coolers and freezers.

### 1.3.3 State of California

In June 2005, California Governor Arnold Schwarzenegger issued Executive Order S-3-05, setting a goal to reduce greenhouse gas emissions to 1990 levels by 2020 and to 80% below 1990 levels by 2050. To support these reduction targets, the California legislature adopted the California Global Warming Solutions Act of 2006, also known as Assembly Bill (AB) 32. This law requires the California Air Resources Board (CARB) to identify statewide baseline emissions, develop a scoping plan of regulatory and market mechanisms to reduce greenhouse gas emissions to 1990 levels by 2020, and continue to calculate and monitor future emissions.

CARB adopted the *Climate Change Scoping Plan* (Scoping Plan) in December 2008, which provides the outline for actions to reduce California's greenhouse gas emissions to 1990 levels by 2020. Although the Scoping Plan does not set forth specific reductions requirements for local governments, it encourages municipal agencies to adopt a reduction goal for municipal operations emissions and to establish similar goals for community emissions that parallel the State's commitment.

Other relevant pieces of state legislation shaping climate action planning in California include Senate Bill (SB) 97, SB 375 and SB 1078. SB 97, signed in August 2007, requires analysis of the greenhouse gas emissions from new land use projects under the California Environmental Quality Act (CEQA). In December 2009, the California Resources Agency adopted amendments to the CEQA Guidelines for the mitigation of greenhouse gas emissions and the effects of greenhouse gas emissions. The amendments also encourage public agencies to make use of programmatic mitigation plans (i.e., climate action plans) and programs from which to tier when they perform individual project analyses.

Subsequent to the adoption of AB 32 and SB 97, the California Attorney General's Office has submitted dozens of comment letters to cities and counties urging them to evaluate potential greenhouse gas emissions impacts from new construction as part of the environmental review process under CEQA. In addition, lawsuits were filed against San Bernardino County and the City of Stockton for failure to sufficiently evaluate greenhouse gas impacts under CEQA.

SB 375, signed in 2008, requires the inclusion of sustainable communities' strategies in regional transportation plans for the purpose of reducing greenhouse gas emissions from transportation sources. The bill also requires CARB to set regional targets for the purpose of reducing greenhouse gas emissions from passenger vehicles for 2020 and 2035.

Signed into law in 2002, the Pavley bill (AB 1493) requires CARB to develop and adopt regulations that achieve the maximum feasible reduction of greenhouse gases from motor vehicles primarily used for non-commercial transportation.

SB 1078, signed in 2002, established a Renewable Portfolio Standard that requires electricity providers to increase purchases of renewable energy resources by 1% per year until they have attained a portfolio of 20% renewable resources. In 2006, SB 107 set a target of 20% renewable generation by 2020; and in 2008, Governor Schwarzenegger signed Executive Order S-14-08 increasing the amount of renewable power generation to 33% by 2020.

The California Green Building Code also aims to reduce statewide greenhouse gas emissions. Taking effect January 2011, the nation's first mandatory green building code, termed "CalGreen," lays out minimum requirements for newly constructed buildings in California. It requires builders to install plumbing that cuts indoor water use by as much as 20%; to divert 50% of construction waste from landfills to recycling; and to use low-pollutant paints, carpets, and floors. For commercial buildings, it requires the installation of water meters for different uses and mandates inspection of energy systems in buildings over 10,000 square feet to ensure mechanical equipment is working efficiently.

### 1.3.4 Regional

The City of Lake Elsinore is part of the Southern California Association of Governments (SCAG). SCAG undertakes planning and policy initiatives that affect the greater Southern California region with the goal of encouraging a more sustainable Southern California. SCAG's 2004 *Compass Blueprint Growth Vision Report* (Compass Blueprint) is a plan that encourages sustainable development that would result in greenhouse gas emissions reductions. The Compass Blueprint is a preferred vision for growth for Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties that has been incorporated into immediate housing allocations and transportation planning decisions. It provides a framework that will help SCAG jurisdictions address growth management cooperatively and will help coordinate regional land use and transportation planning.

SCAG's 2008 *Regional Comprehensive Plan* is an advisory document to local agencies that builds on the Compass Blueprint's vision and addresses important regional issues such as housing, traffic/transportation, water, air quality, and energy throughout the six-county area. The plan includes goals, outcomes, and policies that address regional compliance with AB 32, as well as

other state and federal regulations, including green building standards, regional fossil fuel consumption, and other CARB early action measures discussed above.

Lake Elsinore is also located within the South Coast Air Basin. The South Coast Air Quality Management District (SCAQMD) is the agency principally responsible for comprehensive air pollution control in the Basin. In 2008, SCAQMD released their *Draft Greenhouse Gas Guidance Document* to provide emissions analysis guidance to local jurisdictions within the South Coast Air Basin. This document proposes a tiered approach, whereby the level of detail and refinement needed to determine significance increases with a project's total greenhouse gas emissions. The tiered approach defines projects that are exempt from conducting greenhouse gas analyses under CEQA and projects that are within a greenhouse gas emissions reduction plan, or climate action plan, as less than significant.

The SCAQMD recently adopted Rule 2702, which creates a voluntary greenhouse gas reduction program within the District. Through this rule, the District will fund projects through contracts in response to requests for proposals or purchase reductions from other parties. Reductions obtained by the program may be purchased by persons for a variety of uses.

### 1.3.5 Local

The City of Lake Elsinore is in the final stages of updating its General Plan, which is the master plan that guides land use decisions in Lake Elsinore. Based on recent state legislation and recommendations from the California Attorney General's Office, the City is preparing a Climate Action Plan alongside the General Plan Update and Environmental Impact Report. The Climate Action Plan is intended to: 1) reduce Lake Elsinore's greenhouse gas emissions in a manner consistent with California's statewide emissions reduction trajectory, identified in AB 32 and Executive Order S-3-05; 2) ensure that our efforts to reduce emissions are efficient and cost-effective; and 3) streamline the regulatory process for future development in Lake Elsinore. The greenhouse gas emissions inventory and forecast is an essential first step in this process.

# 2.0 Baseline Greenhouse Gas Emissions Inventory

## 2.1 Methodology

The baseline greenhouse gas emissions inventory identifies the categories of activities, or sectors, within the City of Lake Elsinore's jurisdictional boundary that emit greenhouse gases and quantifies their emissions for the 2008 calendar year. The inventory includes two components: a community-wide analysis and a City government operations (municipal) analysis. The community-wide inventory quantifies greenhouse gas emissions from activities in the energy (residential, commercial, and industrial uses), transportation, solid waste, and recreation sectors in Lake Elsinore. The municipal inventory quantifies emissions from government-owned or -operated buildings and fleet vehicles, operations, and employee commute. The greenhouse gas carbon dioxide is inventoried across all sectors, while accounting of methane, nitrous oxide, and fluorinated gas emissions sources is included where reliable estimation methodologies and data are available.

It is important to note that the City government operations inventory is a subset of the community-wide inventory, meaning that all City government operations emissions are included in the categories of the community-wide inventory. The City government operations inventory should not be added to the community-wide analysis; rather it should be looked at as a piece of the complete picture.

### 2.1.1 Emissions Analysis Software

The community-wide and municipal emissions inventories use the Clean Air and Climate Protection (CACP) software, developed by ICLEI[1] in partnership with the National Association of Clean Air Agencies (NACAA) and Torrie Smith Associates to calculate greenhouse gas emissions. The CACP software is based on the principles and methods of the Local Government Operations Protocol (LGOP).[2] The CACP software estimates greenhouse gas emissions resulting from energy consumption, vehicle miles traveled, solid waste generation, and other major emissions sources. The software calculates emissions using specific factors (or coefficients) according to the type of fuel used or solid waste produced.[3]

CACP aggregates three main greenhouse gas emissions (carbon dioxide, methane, and nitrous oxide) and reports them in terms of equivalent carbon dioxide units, or $CO_2E$ (refer to Section

1 ICLEI is an international association of local governments and national and regional local government organizations that provides technical consulting, training, and information services to support local governments in the implementation of sustainable development at the local level.

2 The Local Government Operations Protocol (2008) is a set of guidelines to assist local governments in consistently and accurately quantifying and reporting greenhouse gas emissions associated with their operations. It was adopted by the California Air Resources Board as a way for local governments to help meet California's AB 32 emissions reduction targets.

3 The emissions coefficients and quantification method employed by the CACP software are consistent with national and international inventory standards established by the Intergovernmental Panel on Climate Change (1996 Revised IPCC Guidelines for the Preparation of National Inventories) and the U.S. Voluntary Greenhouse Gas Reporting Guidelines (EIA form1605).

1.2). Reporting the three main greenhouse gas emissions as $CO_2E$ allows for the consideration of different greenhouse gases in comparable terms. For example, methane is 21 times more powerful than carbon dioxide in its capacity to trap heat, so the CACP software converts one metric ton of methane emissions to 21 metric tons of $CO_2E$.

The CACP software relies on numerous assumptions and is limited by the quantity and quality of available data. Therefore, it is useful to think of any specific number generated by the model as an approximation of the City's greenhouse gas emissions rather than an exact value. Despite these limitations, the CACP software and ICLEI methodology provide the best-available snapshot of Lake Elsinore's greenhouse gas emissions. Additionally, the CACP tool is utilized to promote consistency among municipalities throughout the country and the world.

### 2.1.2 Data Collection and Sources

The Lake Elsinore inventory of greenhouse gas emissions required the collection of data from a variety of sources, including:

- Electricity consumption data provided by Southern California Edison.
- Natural gas consumption data provided by Southern California Gas Company.
- Vehicle miles traveled (VMT) data collected from the California Department of Transportation (Caltrans) Traffic Data Branch.
- Boat launch data from the City of Lake Elsinore's General Fund Operating Budget.
- Solid waste tonnage sent to landfills from the California Integrated Waste Management Board Disposal Reporting System and CR&R Waste Services.
- Municipal data relating to electricity and transportation fuel consumption provided by the City of Lake Elsinore.
- City employee commute data (vehicle miles traveled) based on the results of a City employee commute survey.

Data were collected for calendar year 2008 (January to December). This is the earliest year for which comprehensive and reliable data was available for all sectors of the inventory. The inventory accounts for direct emissions sources located within the City's jurisdictional boundary and five Sphere of Influence areas and indirect emissions that result from activities within this area. Greenhouse gas emissions from solid waste generated within Lake Elsinore that decomposes at landfills outside of the City's boundary is an example of indirect emissions included in this inventory.

## 2.2 Inventory Results

### 2.2.1 Community-Wide Baseline Emissions Inventory

In 2008, the community of Lake Elsinore emitted 506,727 metric tons of $CO_2E$ from the energy (residential, commercial, and industrial uses), transportation, solid waste, and recreation sectors. Fuel consumption in the transportation sector generated 60.6% of the total community-wide emissions. Approximately 32.4% of the total emissions are attributed to energy used in

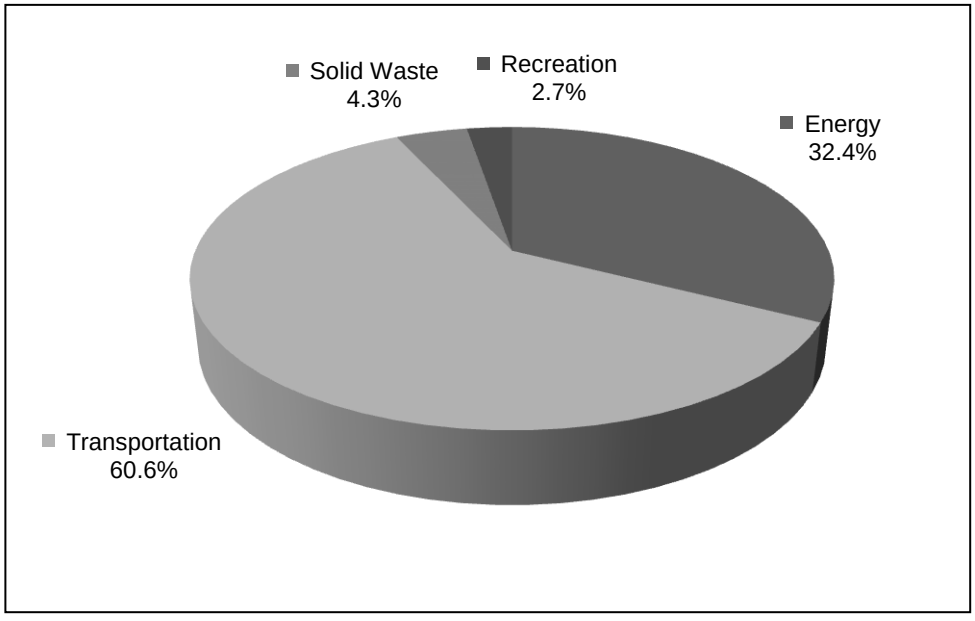
residential, commercial, and industrial buildings. The solid waste sector generated 4.3% of the total community-wide emissions, while the recreation sector accounted for the remaining 4.9% of the total community-wide emissions. Table 2-1 and Figure 2-1 shows Lake Elsinore's estimated 2008 greenhouse gas emissions from all major sectors and the percentage each contributed to the total community-wide emissions.

**Table 2-1. Community-Wide Emissions by Sector (2008)**

| Sector | $CO_2E$ (metric tons) | Percentage of Total |
|---|---|---|
| Energy | 164,311 | 32.4% |
| *Residential* | *87,196* | *17.2%* |
| *Commercial* | *68,461* | *13.5%* |
| *Industrial* | *8,654* | *1.7%* |
| Transportation | 306,955 | 60.6% |
| *Local Roads* | *85,871* | *16.9%* |
| *State Highways* | *221,084* | *43.6%* |
| Solid Waste | 21,622 | 4.3% |
| Recreation | 13,839 | 2.7% |
| **TOTAL** | **506,727** | **100.0%** |

*Source: CACP Model output, 2011.*

**Figure 2-1**
**Community-Wide Emissions by Sector (2008)**



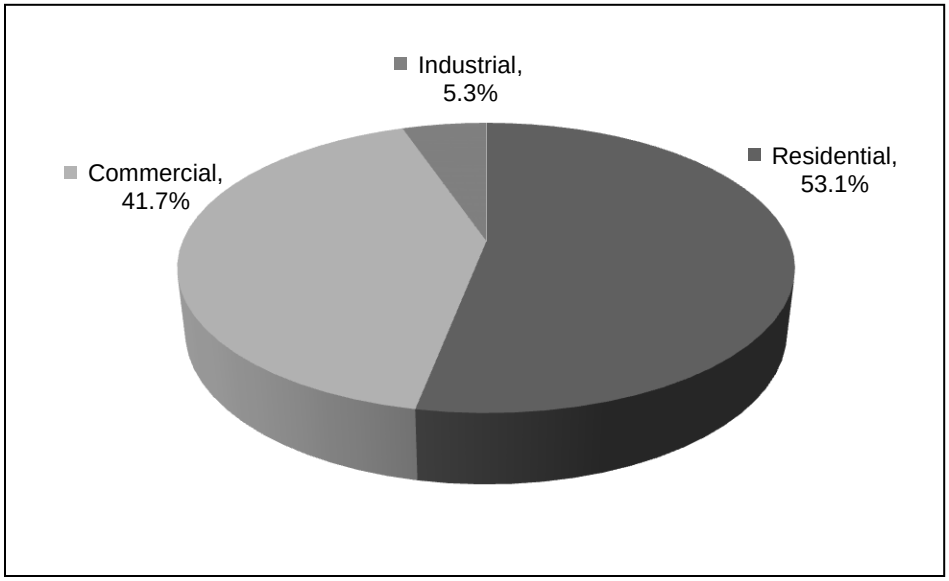
## Energy Emissions

In 2008, Lake Elsinore's total energy consumption by residential, commercial, and industrial buildings and activities was about 262.3 million kWh of electricity[4] and 6.5 million therms of natural gas[5]. This resulted in 164,311 metric tons of $CO_2E$ emissions, which represents approximately 32.4% of Lake Elsinore's total greenhouse gas emissions. These emissions are a result of the combustion of fossil fuel for the production of energy, which includes natural gas combustion for heating and cooking and the production of electricity at coal, natural gas, petroleum, and wood-fired power plants.

Southern California Edison provides electricity to the City of Lake Elsinore and the Southern California Gas Company provides natural gas. Different modes of electricity generation result in different levels of greenhouse gas emissions. The 2008 emissions coefficients from the California Air Resources Board (CARB) California Energy Commission California Grid Average were used to calculate emissions based on citywide electricity use.

Figure 2-2 shows energy emissions broken down by residential, commercial, and industrial uses. Of the total energy emissions, 53.1% was from residential uses, 41.7% was from commercial uses, and 5.3% was from industrial uses.

**Figure 2-2**
**Community-Wide Energy Emissions by Type of Use (2008)**




4 The kilowatt hour (kWh) is most commonly known as a billing unit for energy delivered to consumers by electric utilities. One kWh is equal to 1000 watt hours. Energy in watt hours is the product of power in watts and time in hours.

5 The therm is a unit of heat energy commonly used by gas companies to quantify energy use. One therm is equal to 100,000 British thermal units (BTU). It is approximately the energy equivalent of burning 100 cubic feet of natural gas.

### *Residential*

In 2008, Lake Elsinore's 49,556 residents consumed 121.9 million kWh of electricity (8,156 per household) and 4.9 million therms of natural gas (325 therms per household). This resulted in 87,196 metric tons of $CO_2E$ (17.2% of all emissions, 53.1% of energy emissions).

### *Commercial*

In 2008, Lake Elsinore's commercial uses consumed 124.6 million kWh of electricity and 1.5 million therms of natural gas. This resulted in a release of 68,461 metric tons of $CO_2E$ (13.5% of all emissions, 41.7% of energy emissions).

### *Industrial*

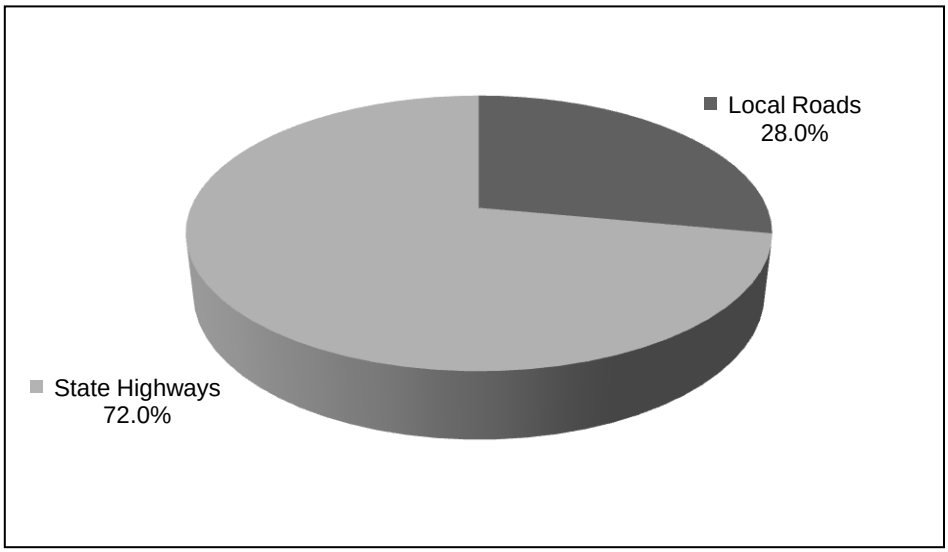
In 2008, Lake Elsinore's industrial uses consumed 15.7 million kWh of electricity and 0.2 million therms of natural gas. This resulted in a release of 8,654 metric tons of $CO_2E$ (1.7% of all emissions, 5.3% of energy emissions).

## Transportation Emissions

The transportation sector produced 306,955 metric tons of $CO_2E$ (60.6% of the total emissions for 2008). Diesel vehicles contributed 17,189 metric tons of $CO_2E$ (5.6% of transportation emissions), and gasoline-powered vehicles added 289,766 metric tons of $CO_2E$ (94.4% of transportation emissions). The total vehicle miles traveled in 2008 on both local roads and state highways was 462,489,675 miles.

Figure 2-3 shows the breakdown of greenhouse gas emissions produced by vehicles on local roads versus state highways (Interstate 15 and State Route 74). Of the total 306,955 metric tons of $CO_2E$ emitted from on-road motor vehicles, 28% was from local roads and 72% was from state highways.

**Figure 2-3**
**Community-Wide Transportation Emissions (2008)**



## Solid Waste Emissions

Emissions from solid waste are a result of organic materials decomposing in the anaerobic environment of a landfill, which produces methane—a greenhouse gas 21 times more potent than carbon dioxide. In 2008, Lake Elsinore sent 21,353 metric tons of solid waste to landfills. This generated approximately 21,622 metric tons of $CO_2E$ emissions. Table 2-2 shows the types of solid waste sent to landfill in 2008.

**Table 2-2. Community-Wide Solid Waste Emissions (2008)**

| Material Type | $CO_2E$ (metric tons) | Percentage of Total |
|---|---|---|
| Paper Products | 13,291 | 61.5% |
| Food Waste | 4,900 | 22.7% |
| Plant Debris | 2,657 | 12.3% |
| Wood or Textiles | 774 | 3.6% |
| **TOTAL** | **21,622** | **100.0%** |

*Source: California Integrated Waste Management Board, Jurisdiction Profile & Solid Waste Characterization Database, accessed March 25, 2010.*

## Recreation Emissions

Recreational boating activities on Lake Elsinore include a variety of boat sizes, powered by both conventional four-stroke and two-stroke engines. In 2008, boating activities on Lake Elsinore produced 13,839 metric tons of $CO_2E$ emissions.

### 2.2.2 Municipal Baseline Emissions Inventory

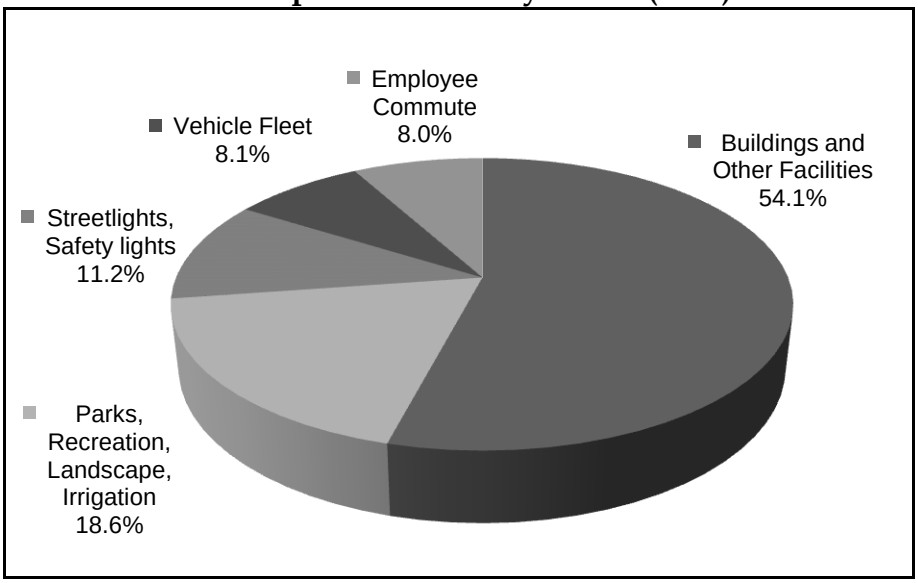
The municipal baseline emissions inventory is a subset of the community-wide inventory. The emissions from municipal operations have been calculated by analyzing the inventory of electricity use, natural gas consumption, and transportation associated with City operations. Municipal operations in 2008 generated approximately 4,324 metric tons of $CO_2E$, which is 0.9% of the total community-wide emissions (local government emissions typically fall between one and five percent of overall community emissions). The majority of the City's municipal emissions are related to energy use for City-operated buildings and facilities, which represents 83.9% of the total emissions. See Table 2-3 and Figure 2-4 for municipal emissions by sector.

**Table 2-3. Municipal Emissions by Sector (2008)**

| Sector | $CO_2E$ (metric tons) | Percentage of Total |
|---|---|---|
| Buildings and Facilities | 3,627 | 83.9% |
| *Buildings and Other Facilities* | *2,340* | *54.1%* |
| *Parks, Recreation, Landscape, Irrigation* | *803* | *18.6%* |
| *Streetlights, Safety lights* | *484* | *11.2%* |
| Transportation | 697 | 16.1% |
| *Vehicle Fleet* | *349* | *8.1%* |
| *Employee Commute* | *348* | *8.0%* |
| **TOTAL** | **4,324** | **100.0%** |

*Source: CACP Model Output, 2011.*

**Figure 2-4**
**Municipal Emissions by Sector (2008)**


Employee Commute 8.0%
Vehicle Fleet 8.1%
Buildings and Other Facilities 54.1%
Streetlights, Safety lights 11.2%
Parks, Recreation, Landscape, Irrigation 18.6%

## Municipal Buildings and Facilities

Lake Elsinore municipal buildings and facilities, including parks and streetlights, consumed 7.5 million kWh of electricity and 4,590 therms of natural gas in 2008. This resulted in a release of 3,143 metric tons of $CO_2E$ emissions.

## Municipal Transportation Emissions

The municipal transportation sector is comprised of two sub-sectors: the City's vehicle fleet and City employee commutes. The City's vehicle fleet includes all vehicles owned and operated by the City of Lake Elsinore. The City's fleet traveled 429,050 total vehicle miles in 2008, emitting 349 metric tons of $CO_2E$ (8.1% of municipal emissions). City employee commute trips produced approximately 348 metric tons of $CO_2E$ (8.0% of municipal emissions).

# 3.0 Greenhouse Gas Emissions Forecast

## 3.1 Methodology

The greenhouse gas emissions forecast provides a business-as-usual estimate of how emissions will change over time if consumption trends and behavior continue as they did in 2008, absent of any new policies or actions that would reduce emissions. The forecast as performed by applying household, employment, and population growth rates to 2008 community-wide greenhouse gas emissions levels. The forecast estimates growth in greenhouse gas emissions that would occur through 2030, accounting for the full extent of the growth permitted under the 2030 General Plan. The forecast is based on the assumption that the number of drivers, electricity and natural gas use, and solid waste tonnage will increase over time in proportion to population, jobs, and housing.

The forecast does not account for emissions reductions from state or federal activities including AB 32; the Renewables Portfolio Standard; changes to Corporate Average Fuel Economy (CAFE) standards; emission reductions achieved from passenger vehicles, light-duty trucks, and non-commercial vehicles under the Pavley bill; and/or SB 375. Additionally, it does not take into account reduction activities already underway or completed since 2008. Thus, the business-as-usual projection represents a conservative estimate of future emissions.

City government operations emissions are not separately analyzed as part of this forecast due to a lack of reliable growth indicators for municipal government operations. For example, population and housing growth are not generally assumed to lead to corresponding increases in municipal facilities and operations. However, municipal operations are a subset of the community-wide analysis, meaning that municipal operations emissions are included within the categories of the community-wide inventory. Therefore, emissions from municipal operations are accounted for within the community-wide forecasts.

## 3.2 Forecast Results

As discussed in Section 2.0, *Baseline Greenhouse Gas Emissions Inventory*, in 2008 the community produced a total of approximately 506,727 metric tons of $CO_2E$. In a business-as-usual scenario, greenhouse gas emissions are projected to reach 1,064,565 metric tons of $CO_2E$ by 2020 (a 110% increase over 2008 baseline levels) and 2,028,819 metric tons of $CO_2E$ by 2030 (a 300% increase over baseline levels). Table 3-1 shows the projected increases in greenhouse gas emissions from 2008 to 2020 and 2030.

## Table 3-1. Projected Community-Wide Emissions by Sector

| Sector | $CO_2E$ (tons) | Percentage of Total |
|---|---|---|
| **Target Year 2020** | | |
| **Energy** | **350,595** | **32.9%** |
| *Residential* | 189,877 | 17.8% |
| *Commercial* | 149,079 | 14% |
| *Industrial* | 11,639 | 1.1% |
| **Transportation** | **636,472** | **59.8%** |
| **Solid Waste** | **47,083** | **4.4%** |
| **Recreation** | **30,415** | **2.9%** |
| **2020 TOTAL** | **1,064,565** | **100.0%** |
| **Target Year 2030** | | |
| **Energy** | **663,216** | **32.7%** |
| *Residential* | 363,175 | 17.9% |
| *Commercial* | 285,142 | 14.1% |
| *Industrial* | 14,899 | 0.7% |
| **Transportation** | **1,217,373** | **60.0%** |
| **Solid Waste** | **90,056** | **4.4%** |
| **Recreation** | **58,174** | **2.9%** |
| **2030 TOTAL** | **2,028,819** | **100.0%** |

*Source: CACP Model output, 2011.*

# 4.0 Conclusion

This report provides a profile of the greenhouse gases that the City of Lake Elsinore emitted on a community-wide and municipal level in 2008. The report also forecasts future greenhouse gas emissions from within the City through 2030.

As the City develops its Climate Action Plan, it will use information in this inventory to determine which greenhouse gas emissions reduction efforts will be most effective and efficient in achieving the City's greenhouse gas emissions target. For example, approximately 60.6% of the community-wide emissions are attributed to transportation sources. Gasoline vehicles comprise 94.4% of all transportation emissions. Therefore, strategies to reduce fuel consumption may decrease overall community emissions more than strategies to reduce energy consumption from recreation. For municipal operations, approximately 83.9% of emissions are related to energy used in municipal buildings and facilities. This information may point to the need to examine ways to make the City's buildings more energy efficient.

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## 5.2 Persons Contacted

Chauncy Tou, Customer Programs, Southern California Gas Company (electronic mail communication, March 29, 2010).

Geoffrey Chiapella, Independent Modeling Contractor (Personal Communications, March 2010).

Gerald Wilson, Account Manager, Southern California Edison (electronic mail communication, March 31, 2010).

Ed Campos, Riverside County Solid Waste Division, CR&R, Incorporated (electronic mail communication, March 16, 2010).

Jessica Guzman, Planning Department, City of Lake Elsinore (electronic mail communications, March 2010).

## 5.3 List of Preparers

This Greenhouse Gas Emissions Inventory Report was prepared by Rincon Consultants, Inc. under contract to the City of Lake Elsinore. Persons involved in data gathering, analysis, project management, and quality control include:

Joe Power, Principal-in-Charge
Shauna Callery, Project Manager
Chris Bersbach, Associate Planner
Rob Fitzroy, Associate Planner

# APPENDIX

Clean Air and Climate Protection 2009 Software
Version 2.2.1 Results

# Government Greenhouse Gas Emissions in 2008
# Detailed Report

| | $CO_2$ (tons) | $N_2O$ (lbs) | $CH_4$ (lbs) | Equiv $CO_2$ (tons) | (%) | Energy (MMBtu) | Cost ($) |
|---|---|---|---|---|---|---|---|
| **Buildings and Facilities** | | | | | | | |
| **Lake Elsinore, California** | | | | | | | |
| *Buildings and Other Facilities* | | | | | | | |
| Electricity | 2,303 | 53 | 139 | 2,313 | 53.5 | 16,402 | 1,085,777 |
| Natural Gas | 27 | 0 | 5 | 27 | 0.6 | 459 | 6,434 |
| *Subtotal Buildings and Other F* | 2,330 | 53 | 144 | 2,340 | 54.1 | 16,861 | 1,092,211 |
| Electricity data for 2008 provided by the City of Lake Elsinore.<br>Natural gas data for 2008 provided by Southern California Gas.<br>Operating house assumes 5 working days per week, 8 hours per day.<br>Occupants is the number of City employees | | | | | | | |
| *Parks, Recreation, Landscaping, Irrigation* | | | | | | | |
| Electricity | 800 | 18 | 48 | 803 | 18.6 | 5,698 | 194,896 |
| *Subtotal Parks, Recreation, La* | 800 | 18 | 48 | 803 | 18.6 | 5,698 | 194,896 |
| Electricity data for 2008 provided by the City of Lake Elsinore.<br>Operating hours assumes 12 hours per day, 365 days per year. | | | | | | | |
| **Subtotal Buildings and Facilities** | 3,130 | 71 | 193 | 3,143 | 72.7 | 22,559 | 1,287,107 |
| **Streetlights & Traffic Signals** | | | | | | | |
| **Lake Elsinore, California** | | | | | | | |
| *Streetlights, Safety Lights* | | | | | | | |
| Electricity | 482 | 11 | 29 | 484 | 11.2 | 3,432 | 122,076 |
| *Subtotal Streetlights, Safety Li* | 482 | 11 | 29 | 484 | 11.2 | 3,432 | 122,076 |
| Electricity data for 2008 provided by the City of Lake Elsinore. | | | | | | | |
| **Subtotal Streetlights & Traffic Si** | 482 | 11 | 29 | 484 | 11.2 | 3,432 | 122,076 |
| **Vehicle Fleet** | | | | | | | |
| **Lake Elsinore, California** | | | | | | | |
| *City Vehicles* | | | | | | | |
| Diesel | 45 | 0 | 0 | 45 | 1.0 | 561 | 0 |
| Gasoline | 298 | 39 | 33 | 304 | 7.0 | 3,809 | 0 |
| *Subtotal City Vehicles* | 343 | 39 | 33 | 349 | 8.1 | 4,370 | 0 |
| City of Lake Elsinore Equipment Inventory provided by Mary Zilliox, (951) 674-5170, mzilliox@lake-elsinore.org, Department of Public Works, City of Lake Elsinore. | | | | | | | |

This report has been generated for Lake Elsinore, California using ICLEI's Clean Air and Climate Protection 2009 Software.

# Government Greenhouse Gas Emissions in 2008
# Detailed Report

| | $CO_2$ (tons) | $N_2O$ (lbs) | $CH_4$ (lbs) | Equiv $CO_2$ (tons) | (%) | Energy (MMBtu) | Cost ($) |
|---|---|---|---|---|---|---|---|
| **Subtotal Vehicle Fleet** | 343 | 39 | 33 | 349 | 8.1 | 4,370 | 0 |
| **Employee Commute** | | | | | | | |
| **Lake Elsinore, California** | | | | | | | |
| *Employee Commute* | | | | | | | |
| Gasoline | 340 | 44 | 41 | 348 | 8.0 | 4,357 | 105,210 |
| *Subtotal Employee Commute* | 340 | 44 | 41 | 348 | 8.0 | 4,357 | 105,210 |

Employee commute data collected by survey, distrbuted to all City employees. Responses from 30 employees were extrapolated to the total number of City employees (110).
Gasoline price was assumed to be $3/gallon.
Average vehicle mileage from Bureau of Transportation Services National Transportation Statistics, 2007.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Subtotal Employee Commute** | 340 | 44 | 41 | 348 | 8.0 | 4,357 | 105,210 |
| **Total** | 4,295 | 165 | 296 | 4,324 | 100.0 | 34,718 | 1,514,393 |

# Community Greenhouse Gas Emissions in 2008
# Detailed Report

| | $CO_2$ (tons) | $N_2O$ (lbs) | $CH_4$ (lbs) | Equiv $CO_2$ (tons) | (%) | Energy (MMBtu) |
|---|---|---|---|---|---|---|
| **Residential** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *Residential* | | | | | | |
| Electricity | 58,443 | 1,341 | 3,537 | 58,688 | 11.6 | 416,208 |
| Natural Gas | 28,435 | 107 | 5,359 | 28,508 | 5.6 | 486,163 |
| *Subtotal Residential* | 86,878 | 1,449 | 8,896 | 87,196 | 17.2 | 902,371 |
| kWh usage provided by Southern California Edison.<br>Natural gas usage provided by Southern California Gas Company<br>Number of Households: SCAG, based on California Department of Finance Data | | | | | | |
| **Subtotal Residential** | 86,878 | 1,449 | 8,896 | 87,196 | 17.2 | 902,371 |
| **Commercial** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *Commercial* | | | | | | |
| Electricity | 59,700 | 1,370 | 3,613 | 59,950 | 11.8 | 425,154 |
| Natural Gas | 8,489 | 32 | 1,600 | 8,511 | 1.7 | 145,148 |
| *Subtotal Commercial* | 68,189 | 1,402 | 5,213 | 68,461 | 13.5 | 570,302 |
| kWh usage provided by Southern California Edison.<br>Natural gas usage provided by Southern California Gas Company, split proportionally between commercial and industrial based on electricity usage split.<br>Number of Commercial sqft: City of Lake Elsinore permitted commercial sqft between 1990 and 2009, projected to 2008 based on California Department of Finance Data.<br>Commercial Employees: SCAG data for City jobs, split proportionally between commercial and industrial based on square footage | | | | | | |
| **Subtotal Commercial** | 68,189 | 1,402 | 5,213 | 68,461 | 13.5 | 570,302 |
| **Industrial** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *Industrial* | | | | | | |
| Electricity | 7,548 | 173 | 457 | 7,580 | 1.5 | 53,754 |
| Natural Gas | 1,073 | 4 | 40 | 1,074 | 0.2 | 18,352 |
| *Subtotal Industrial* | 8,621 | 177 | 497 | 8,654 | 1.7 | 72,105 |
| kWh usage provided by Southern California Edison.<br>Natural gas usage provided by Southern California Gas Company, split proportionally between commercial and industrial based on electricity usage split.<br>Number of Industrial sqft: City of Lake Elsinore permitted industrial sqft between 1990 and 2009, projected to 2008 based on California Department of Finance Data.<br>Industrial Employees: SCAG data for City jobs, split proportionally between commercial and industrial based on square footage | | | | | | |

This report has been generated for Lake Elsinore, California using ICLEI's Clean Air and Climate Protection 2009 Software.

# Community Greenhouse Gas Emissions in 2008
# Detailed Report

| | $CO_2$ (tons) | $N_2O$ (lbs) | $CH_4$ (lbs) | Equiv $CO_2$ (tons) | (%) | Energy (MMBtu) |
|---|---|---|---|---|---|---|
| **Subtotal Industrial** | 8,621 | 177 | 497 | 8,654 | 1.7 | 72,105 |
| **Transportation** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *Road* | | | | | | |
| Diesel | 17,172 | 102 | 107 | 17,189 | 3.4 | 212,965 |
| Gasoline | 283,679 | 37,115 | 31,847 | 289,766 | 57.2 | 3,630,770 |
| OFF ROAD Gasoline | 13,839 | 0 | 0 | 13,839 | 2.7 | 177,023 |
| *Subtotal Road* | 314,690 | 37,217 | 31,954 | 320,794 | 63.3 | 4,020,758 |

2008 public road DVMT from Caltrans, 2008 Caltrans California Public Road Data.

State highway data from Caltrans Traffic Data Branch, 2008 AADT. Postmile data for city limits estimated using Google Earth.

Assumes 20% pass-through trips, based on SCAG and KernCOG data.

Boat fuel consumption estimated using data from the General Fund Operating Budget FY 2008-2009 (# of annual launches) and CA Dept. of Boating and Waterways (statewide boat size demographics).

| | | | | | | |
|---|---|---|---|---|---|---|
| **Subtotal Transportation** | 314,690 | 37,217 | 31,954 | 320,794 | 63.3 | 4,020,758 |
| **Waste** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *CR&R Disposal* | | | | | | *Disposal Method - Managed Landfill* |
| Paper Products | 0 | 0 | 1,265,823 | 13,291 | 2.6 | |
| Food Waste | 0 | 0 | 466,675 | 4,900 | 1.0 | |
| Plant Debris | 0 | 0 | 253,012 | 2,657 | 0.5 | |
| Wood or Textiles | 0 | 0 | 73,718 | 774 | 0.2 | |
| *Subtotal CR&R Disposal* | 0 | 0 | 2,059,227 | 21,622 | 4.3 | |

Total waste tonnage for 2008 from the California Integrated Waste Management Board's Jurisdiction Profile ("waste flows" tab): http://www.calrecycle.ca.gov/profiles/Juris/JurProfile2.asp?RG=C&JURID=244&JUR=Lake+Elsinore

Solid waste characterization for 1999 (assumed to be fundamentally similar to 2008) from the California Integrated Waste Management Board's Solid Waste Characterization Database (select "RIV - LAKE ELSINORE", then "Overall by material type" for residential and commercial): http://www.calrecycle.ca.gov/Wastechar/JurisSel.asp

| | | | | | | |
|---|---|---|---|---|---|---|
| **Subtotal Waste** | 0 | 0 | 2,059,227 | 21,622 | 4.3 | |
| **Total** | 478,379 | 40,245 | 2,105,787 | 506,728 | 100.0 | 5,565,536 |

# Community Greenhouse Gas Emissions in 2020
# Detailed Report

| | $CO_2$ (tons) | $N_2O$ (lbs) | $CH_4$ (lbs) | Equiv $CO_2$ (tons) | Equiv $CO_2$ (%) | Energy (MMBtu) |
|---|---|---|---|---|---|---|
| **Residential** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *Residential* | | | | | | |
| Electricity | 127,265 | 2,921 | 7,701 | 127,799 | 12.0 | 906,324 |
| Natural Gas | 61,919 | 233 | 11,670 | 62,078 | 5.8 | 1,058,657 |
| *Subtotal Residential* | 189,184 | 3,154 | 19,371 | 189,877 | 17.8 | 1,964,981 |
| kWh usage provided by Southern California Edison.<br>Natural gas usage provided by Southern California Gas Company<br>Number of Households: SCAG, based on California Department of Finance Data | | | | | | |
| **Subtotal Residential** | 189,184 | 3,154 | 19,371 | 189,877 | 17.8 | 1,964,981 |
| **Commercial** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *Commercial* | | | | | | |
| Electricity | 130,000 | 2,984 | 7,867 | 130,546 | 12.3 | 925,805 |
| Natural Gas | 18,487 | 70 | 3,484 | 18,534 | 1.7 | 316,070 |
| *Subtotal Commercial* | 148,487 | 3,054 | 11,351 | 149,079 | 14.0 | 1,241,875 |
| kWh usage provided by Southern California Edison.<br>Natural gas usage provided by Southern California Gas Company, split proportionally between commercial and industrial based on electricity usage split.<br>Number of Commercial sqft: City of Lake Elsinore permitted commercial sqft between 1990 and 2009, projected to 2008 based on California Department of Finance Data.<br>Commercial Employees: SCAG data for City jobs, split proportionally between commercial and industrial based on square footage | | | | | | |
| **Subtotal Commercial** | 148,487 | 3,054 | 11,351 | 149,079 | 14.0 | 1,241,875 |
| **Industrial** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *Industrial* | | | | | | |
| Electricity | 10,151 | 233 | 614 | 10,194 | 1.0 | 72,292 |
| Natural Gas | 1,444 | 5 | 54 | 1,445 | 0.1 | 24,681 |
| *Subtotal Industrial* | 11,595 | 238 | 669 | 11,639 | 1.1 | 96,973 |
| kWh usage provided by Southern California Edison.<br>Natural gas usage provided by Southern California Gas Company, split proportionally between commercial and industrial based on electricity usage split.<br>Number of Industrial sqft: City of Lake Elsinore permitted industrial sqft between 1990 and 2009, projected to 2008 based on California Department of Finance Data.<br>Industrial Employees: SCAG data for City jobs, split proportionally between commercial and industrial based on square footage | | | | | | |

This report has been generated for Lake Elsinore, California using ICLEI's Clean Air and Climate Protection 2009 Software.

# Community Greenhouse Gas Emissions in 2020
# Detailed Report

| | $CO_2$ (tons) | $N_2O$ (lbs) | $CH_4$ (lbs) | Equiv $CO_2$ (tons) | (%) | Energy (MMBtu) |
|---|---|---|---|---|---|---|
| **Subtotal Industrial** | 11,595 | 238 | 669 | 11,639 | 1.1 | 96,973 |
| **Transportation** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *Road* | | | | | | |
| Diesel | 37,394 | 222 | 233 | 37,431 | 3.5 | 463,747 |
| Gasoline | 585,787 | 80,821 | 69,349 | 599,042 | 56.3 | 7,497,414 |
| OFF ROAD Gasoline | 30,135 | 1,505 | 4,378 | 30,415 | 2.9 | 385,482 |
| *Subtotal Road* | 653,316 | 82,548 | 73,960 | 666,887 | 62.6 | 8,346,643 |

2008 public road DVMT from Caltrans, 2008 Caltrans California Public Road Data.

State highway data from Caltrans Traffic Data Branch, 2008 AADT. Postmile data for city limits estimated using Google Earth.

Assumes 20% pass-through trips, based on SCAG and KernCOG data.

Boat fuel consumption estimated using data from the General Fund Operating Budget FY 2008-2009 (# of annual launches) and CA Dept. of Boating and Waterways (statewide boat size demographics).

| | | | | | | |
|---|---|---|---|---|---|---|
| **Subtotal Transportation** | 653,316 | 82,548 | 73,960 | 666,887 | 62.6 | 8,346,643 |
| **Waste** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *CR&R Disposal* | | | | | | *Disposal Method - Managed Landfill* |
| Paper Products | 0 | 0 | 2,756,423 | 28,942 | 2.7 | |
| Food Waste | 0 | 0 | 1,016,219 | 10,670 | 1.0 | |
| Plant Debris | 0 | 0 | 550,952 | 5,785 | 0.5 | |
| Wood or Textiles | 0 | 0 | 160,526 | 1,686 | 0.2 | |
| *Subtotal CR&R Disposal* | 0 | 0 | 4,484,121 | 47,083 | 4.4 | |

Total waste tonnage for 2008 from the California Integrated Waste Management Board's Jurisdiction Profile ("waste flows" tab): http://www.calrecycle.ca.gov/profiles/Juris/JurProfile2.asp?RG=C&JURID=244&JUR=Lake+Elsinore

Solid waste characterization for 1999 (assumed to be fundamentally similar to 2008) from the California Integrated Waste Management Board's Solid Waste Characterization Database (select "RIV - LAKE ELSINORE", then "Overall by material type" for residential and commercial): http://www.calrecycle.ca.gov/Wastechar/JurisSel.asp

| | | | | | | |
|---|---|---|---|---|---|---|
| **Subtotal Waste** | 0 | 0 | 4,484,121 | 47,083 | 4.4 | |
| **Total** | 1,002,582 | 88,994 | 4,589,472 | 1,064,565 | 100.0 | 11,650,472 |

# Community Greenhouse Gas Emissions in 2030
# Detailed Report

| | $CO_2$ (tons) | $N_2O$ (lbs) | $CH_4$ (lbs) | Equiv $CO_2$ (tons) | (%) | Energy (MMBtu) |
|---|---|---|---|---|---|---|
| **Residential** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *Residential* | | | | | | |
| Electricity | 243,418 | 5,587 | 14,730 | 244,439 | 12.0 | 1,733,515 |
| Natural Gas | 118,433 | 446 | 22,320 | 118,736 | 5.9 | 2,024,881 |
| *Subtotal Residential* | 361,851 | 6,034 | 37,050 | 363,175 | 17.9 | 3,758,396 |
| kWh usage provided by Southern California Edison.<br>Natural gas usage provided by Southern California Gas Company<br>Number of Households: SCAG, based on California Department of Finance Data | | | | | | |
| **Subtotal Residential** | 361,851 | 6,034 | 37,050 | 363,175 | 17.9 | 3,758,396 |
| **Commercial** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *Commercial* | | | | | | |
| Electricity | 248,650 | 5,707 | 15,046 | 249,693 | 12.3 | 1,770,777 |
| Natural Gas | 35,359 | 133 | 6,664 | 35,450 | 1.7 | 604,543 |
| *Subtotal Commercial* | 284,009 | 5,840 | 21,710 | 285,142 | 14.1 | 2,375,320 |
| kWh usage provided by Southern California Edison.<br>Natural gas usage provided by Southern California Gas Company, split proportionally between commercial and industrial based on electricity usage split.<br>Number of Commercial sqft: City of Lake Elsinore permitted commercial sqft between 1990 and 2009, projected to 2008 based on California Department of Finance Data.<br>Commercial Employees: SCAG data for City jobs, split proportionally between commercial and industrial based on square footage | | | | | | |
| **Subtotal Commercial** | 284,009 | 5,840 | 21,710 | 285,142 | 14.1 | 2,375,320 |
| **Industrial** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *Industrial* | | | | | | |
| Electricity | 12,994 | 298 | 786 | 13,049 | 0.6 | 92,540 |
| Natural Gas | 1,848 | 7 | 70 | 1,850 | 0.1 | 31,593 |
| *Subtotal Industrial* | 14,842 | 305 | 856 | 14,899 | 0.7 | 124,134 |
| kWh usage provided by Southern California Edison.<br>Natural gas usage provided by Southern California Gas Company, split proportionally between commercial and industrial based on electricity usage split.<br>Number of Industrial sqft: City of Lake Elsinore permitted industrial sqft between 1990 and 2009, projected to 2008 based on California Department of Finance Data.<br>Industrial Employees: SCAG data for City jobs, split proportionally between commercial and industrial based on square footage | | | | | | |

This report has been generated for Lake Elsinore, California using ICLEI's Clean Air and Climate Protection 2009 Software.

# Community Greenhouse Gas Emissions in 2030
# Detailed Report

| | $CO_2$ (tons) | $N_2O$ (lbs) | $CH_4$ (lbs) | Equiv $CO_2$ (tons) | (%) | Energy (MMBtu) |
|---|---|---|---|---|---|---|
| **Subtotal Industrial** | 14,842 | 305 | 856 | 14,899 | 0.7 | 124,134 |
| **Transportation** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *Road* | | | | | | |
| Diesel | 71,523 | 424 | 445 | 71,593 | 3.5 | 887,003 |
| Gasoline | 1,120,427 | 154,585 | 132,643 | 1,145,781 | 56.5 | 14,340,216 |
| OFF ROAD Gasoline | 57,639 | 2,879 | 8,374 | 58,174 | 2.9 | 737,306 |
| *Subtotal Road* | 1,249,589 | 157,888 | 141,463 | 1,275,547 | 62.9 | 15,964,526 |

2008 public road DVMT from Caltrans, 2008 Caltrans California Public Road Data.

State highway data from Caltrans Traffic Data Branch, 2008 AADT. Postmile data for city limits estimated using Google Earth.

Assumes 20% pass-through trips, based on SCAG and KernCOG data.

Boat fuel consumption estimated using data from the General Fund Operating Budget FY 2008-2009 (# of annual launches) and CA Dept. of Boating and Waterways (statewide boat size demographics).

| | | | | | | |
|---|---|---|---|---|---|---|
| **Subtotal Transportation** | 1,249,589 | 157,888 | 141,463 | 1,275,547 | 62.9 | 15,964,526 |
| **Waste** | | | | | | |
| **Lake Elsinore, California** | | | | | | |
| *CR&R Disposal* | | | | | | *Disposal Method - Managed Landfill* |
| Paper Products | 0 | 0 | 5,272,179 | 55,358 | 2.7 | |
| Food Waste | 0 | 0 | 1,943,711 | 20,409 | 1.0 | |
| Plant Debris | 0 | 0 | 1,053,800 | 11,065 | 0.5 | |
| Wood or Textiles | 0 | 0 | 307,037 | 3,224 | 0.2 | |
| *Subtotal CR&R Disposal* | 0 | 0 | 8,576,726 | 90,056 | 4.4 | |

Total waste tonnage for 2008 from the California Integrated Waste Management Board's Jurisdiction Profile ("waste flows" tab): http://www.calrecycle.ca.gov/profiles/Juris/JurProfile2.asp?RG=C&JURID=244&JUR=Lake+Elsinore

Solid waste characterization for 1999 (assumed to be fundamentally similar to 2008) from the California Integrated Waste Management Board's Solid Waste Characterization Database (select "RIV - LAKE ELSINORE", then "Overall by material type" for residential and commercial): http://www.calrecycle.ca.gov/Wastechar/JurisSel.asp

| | | | | | | |
|---|---|---|---|---|---|---|
| **Subtotal Waste** | 0 | 0 | 8,576,726 | 90,056 | 4.4 | |
| **Total** | 1,910,292 | 170,067 | 8,777,805 | 2,028,819 | 100.0 | 22,222,375 |

# Appendix B

*Greenhouse Gas Emissions Reduction Analysis Calculations*

# Appendix B: Greenhouse Gas Emissions Reduction Analysis Calculations

This appendix outlines the assumptions, sources, and calculations behind estimates of greenhouse gas (GHG) emissions reductions. Most local estimates were facilitated through the Climate and Air Pollution Planning Assistant (CAPPA) tool developed by Local Governments for Sustainability (ICLEI), with some supplemental information provided from the California Energy Commission's *2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings* and the California Air Pollution Control Officers Association's (CAPCOA) *Quantifying Greenhouse Gas Mitigation Measures* (2010) white paper. The CAPPA tool and CAPCOA white paper were created to assist local governments in analyzing potential GHG reduction opportunities. Input data and assumptions are City-specific, while the conversion to $CO_2e$ was completed in the CAPPA tool using verified emissions coefficients. The local reductions anticipated to occur from state-level regulations are explained at the end of this appendix.

## B.1 Local Reduction Analysis Calculations

**Table B-1. Assumptions for Transportation and Land Use Measures**

| Measure Number and Title | Assumptions | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|---|
| **Strategy T-1: Increase bicycle, pedestrian and public transit travel** | | | |
| Measure T-1.1: Safe Routes to School | 5% of children walking/biking to school by 2020; 10% of children walking/biking to school by 2030 (children = 1.37*households in 2020 or 2030) 4,264 children walking/biking to school by 2020 and 8,527 children walking/biking by 2030. Assumed 180 school days per year, an average of 1.5 miles driven to drop off and 1.5 miles to pick up student, and an average passenger vehicle fuel economy of 19.7 mpg. Reduction of 0.07 MT $CO_2e$/yr per student. | 288 | 576 |
| Measure T-1.2: Pedestrian Infrastructure | 1.5% of local trips (approximately 22,440 at 1 mile each) shift from car to walking by 2020 and 3% (approximately 44,880 at 1 mile each) by 2030. Assumed average passenger vehicle fuel economy to be 19.7 mpg. Assumed 28% of trips are local | 556 | 1,115 |

| Measure Number and Title | Assumptions | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|---|
| | trips, same as 2008. Assumed average passenger vehicle fuel economy to be 19.7 mpg. Assumed to be separate from the walking trips in measure T-1.1. In combination with Measures T-1.3 and EO-1.4. | | |
| Measure T-1.3: Street and Sidewalk Maintenance and Improvements | Contributes to T-1.2 and T-1.4 assumptions and potential emissions reductions. | Contributes to Measure T-1.2 and T-1.4 reduction potential | Contributes to Measure T-1.2 and T-1.4 reduction potential |
| Measure T-1.4: Bicycle Infrastructure | 1.5% of local weekly trips (approximately 22,440 trips) shift from car to bicycling by 2020 and 3% (approximately 44,880 weekly trips) by 2030. Assumed average passenger vehicle fuel economy to be 19.7 mpg and average trip length of trip avoided to be 4 miles. Assumed 28% of trips are local trips, same as 2008. Assumed to be separate from the bicycling trips in measure T-1.1. In combination with Measures T-1.3, 1.5 and EO 1.4. | 2,230 | 4,460 |
| Measure T-1.5: Bicycle Parking Standards | Contributes to T-1.4 assumptions and potential emissions reductions. | Contributes to Measure T-1.4 reduction potential | Contributes to Measure T-1.4 reduction potential |
| Measure T-1.6: Public Transit Incentives | 1.5% increase in service population transit trips by 2020; 3% increase in service population transit trips by 2030. 4,548 additional daily transit trips replacing auto trips by 2020 and 9,097 additional daily transit trips replacing auto trips in 2030. Assumed average passenger vehicle fuel economy to be 19.7 mpg and average one way trip length to be 9.8 miles. | 2,527 | 5,055 |
| **Strategy T-2: Manage vehicle parking** | | | |
| Measure T-2.1: Designated Parking for Fuel-Efficient Vehicles | 5% of employees (4,674) offered carpool/vanpool, resulting in an 8% reduction in their commute trips by 2020; 10% of employees (9,348) offered carpool/vanpool, resulting in an 8% reduction in their commute trips by 2030. Average one-way commute length assumed to be 9.8 and average passenger vehicle fuel economy to be 19.7 mpg. Fuel-efficient vehicles are not included in the reduction potential for this measure as it supports Measure T-5.1. | 872 | 1,744 |

| Measure Number and Title | Assumptions | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|---|
| **Strategy T-3: Increase efficiency of land use patterns** | | | |
| Measure T-3.1: Mixed-Use, High Density, Infill and Transit Oriented Development | 10% of new residential development (4,610 units) in mixed-use, high-density, or other transit-oriented development, or otherwise accessible by public transit services in 2020 and 20% (9,220 units) by 2030. Annual reduction in vehicle miles per person assumed to be 3,652 and average fuel economy assumed to be 19.7 mpg based on studies identified in CAPPA tool. In combination with Measures T-3.2, T-3.3, and T-3.4. | 27,107 | 54,215 |
| Measure T-3.2: Mixed-Use, Infill, and Transit Oriented Development Incentives | Contributes to T-3.1 assumptions and potential emissions reductions. | Contributes to Measure T-3.1 reduction potential | Contributes to Measure T-3.1 reduction potential |
| Measure T-3.3: Density Bonus Incentive | Contributes to T-3.1 assumptions and potential emissions reductions. | Contributes to Measure T-3.1 reduction potential | Contributes to Measure T-3.1 reduction potential |
| Measure T-3.4: Neighborhood Commercial Centers | Contributes to T-3.1 assumptions and potential emissions reductions. | Contributes to Measure T-3.1 reduction potential | Contributes to Measure T-3.1 reduction potential |
| **Strategy T-4: Reduce trips** | | | |
| Measure T-4.1: Commute Trip Reduction Program | 10% of 2020 employees (9,348) offered telecommuting, with 5% of them telecommuting each workday; 20% of 2030 employees (18,696) offered telecommuting, with 5% of them telecommuting each workday. Average one-way commute length assumed to be 15 miles and average passenger vehicle fuel economy assumed to be 19.7 mpg based on studies reported in CAPPA tool. | 1,608 | 3,216 |
| **Strategy T-5: Increase the use of low- and zero-emissions vehicles** | | | |
| Measure T-5.1: Hybrid and Fuel-Efficient Vehicle Incentives | 2.5% of residents switch to hybrids or smaller vehicles by 2020 (5,243 purchased); 5% of residents purchase hybrids by 2030 (10,487 residents), in combination with measure T-2.1. | 26,924 | 53,848 |
| Measure T-5.2: Municipal Fleet Vehicle Purchasing Policy | 7 vehicles replaced by 2020; another 8 replaced by 2030 (total of 15 replaced). Assumed average vehicle will get 46 mpg, 19.7 mpg of vehicle replaced, and 12,042 average annual | 25 | 50 |

| Measure Number and Title | Assumptions | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|---|
| | miles per vehicle. | | |
| | ***Total Reduction from Transportation and Land Use Measures*** | ***62,138*** | ***124,279*** |

## Table B-2. Assumptions for Energy Measures

| Measure Number and Title | Assumptions | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|---|
| **Strategy E-1: Reduce energy demand of new construction** | | | |
| Measure E-1.1: Tree Planting Requirements | 1,500 trees planted by 2020; 3,000 trees planted by 2030. Annual energy savings of one tree assumed to be 7 kWh and annual carbon dioxide absorbed by one mature tree to be 0.25. | 378 | 757 |
| Measure E-1.2: Cool Roof Requirements | 100% of new non-residential development comply; new commercial (33,688,000 sf) and industrial (4,951,000 sf) floor area by 2030 (total 38,639,000 sf). Annual electricity savings per roof square foot assumed to be 0.84 kWh and -0.0033 therms of natural gas per square foot. Sources: CAPPA and ENERGY STAR roofing calculator. | 5,934 | 11,868 |
| Measure E-1.3: Energy Efficient Building Standards | 100% of new development achieves 15% energy efficiency above Title 24 baseline. Source: California Energy Commission, Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. | 41,302 | 82,604 |
| **Strategy E-2: Increase energy efficiency of existing buildings** | | | |
| Measure E-2.1: Energy Efficiency Upgrades and Retrofits | 20% of existing buildings would implement energy efficiency upgrades or retrofits that reduce energy consumption 20% by 2020; 40% of existing buildings would implement energy efficiency upgrades or retrofits that reduce energy consumption 20% by 2030. Improvements assumed to include efficient light bulbs and fixtures, appliances, increased insulation, new windows, and HVAC systems upgrades. Sources: California Energy Commission Impact | 26,528 | 53,057 |

| Measure Number and Title | Assumptions | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|---|
| | Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings; CAPCOA, 2010. | | |
| Measure E-2.2: Green Business Certification Program | 500 businesses participating by 2020; 1,000 businesses participating by 2030. Contributes to Measure E-2.1 performance and reduction potential. | Contributes to Measure E-2.1 reduction potential by 2,998 MT $CO_2e$ | Contributes to Measure E-2.1 reduction potential by 5,997 MT $CO_2e$ |
| Measure E-2.3: Compact Fluorescent Light Bulb (CFL) Distribution Program | 1,000 bulbs distributed/year through 2015 (4,000 CFLs total). Contributes to Measure E-2.1 performance and reduction potential. | Contributes to Measure E-2.1 reduction potential by 60 MT $CO_2e$ | Contributes to Measure E-2.1 reduction potential by 60 MT $CO_2e$ |
| **Strategy E-3: Increase in energy efficiency of municipal buildings and facilities by 15% by 2020 and 20% by 2030** | | | |
| Measure E-3.1: City HVACs | 27,000 sf of space (estimate of City Hall, Senior Center and Community Center based on Google Earth). | 3 | 3 |
| Measure E-3.2: Energy Efficient Street and Traffic Signal Lights | 50% of the 2,106 street lights replaced by 2020 and 100% replaced by 2030; 36 traffic lights replaced. Assumed 2,106 new LED street lights and 36 traffic signal lights with buildout of the General Plan. | 274 | 548 |
| Measure E-3.3: Street Light Automatic Daylighting Control Devices | 100% installation on the City's 2,106 street lights by 2015; 2 daily hours reduced. | 100 | 100 |
| Measure: E-3.4: Energy Efficient Lights, Ballasts, and Occupancy Sensors at City Facilities | 100% installation on 625 fixtures by 2015; 56% savings. | 33 | 33 |
| Measure E-3.5: Municipal Energy Efficiency Upgrades and Purchasing Standards | 15% energy reduction from equipment purchases and upgrades (excluding lighting) by 2020 and 20% by 2030. | 471 | 629 |
| **Strategy E-4: Decrease water consumption** | | | |
| Measure E-4.1: Landscaping Ordinance | 100% of new residences and 5% of existing residences reduce outdoor water consumption by 20% by 2020 (23,800 residences); 100% of new residences and 10% of existing residences reduce outdoor water consumption by 20% by 2030 (47,600 residences). | 3,602 | 7,205 |

| Measure Number and Title | Assumptions | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|---|
| Measure E-4.2: Indoor Water Conservation Requirements | 100% of new development in 2020 reduces indoor water usage by 30%; 100% of new development in 2030 reduces indoor water usage by 30%. | 6,940 | 13,881 |
| **Strategy E-5: Increase the use of renewable energy** | | | |
| Measure E-5.1: Renewable Energy Incentives | 200 residential solar PV systems (avg 3 kW/residence) and 150 commercial PV systems (avg 10 kW/business) added, totaling 2,100 kW, and 5% of households install solar hot water systems by 2020; 400 residential solar PV systems (avg 3 kW/residence) and 300 commercial PV systems (avg 10 kW/business) added, totaling 4,200 kW, and 10% of households install solar hot water systems by 2030. Assumed to be separate from any solar systems installed as part of Measure E-1.3. | 3,566 | 7,132 |
| | ***Total Reduction from Energy Measures*** | ***89,131*** | ***177,817*** |

## Table B-3. Assumptions for Solid Waste Measures

| Measure Number and Title | Assumptions | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|---|
| **Strategy S-1: Increase solid waste diversion** | | | |
| Measure S-1.1: Commercial Recycling | 65% of commercial waste diverted by 2020; 75% of commercial waste diverted by 2030. Assumes commercial waste was not diverted prior to 2008. As of 2008, the disposal rate per employee in Lake Elsinore was 21.5 lbs/day. Therefore it is assumed that disposal rates per employee will decrease to 7.5 lbs/day by 2020 and 5.3 lbs/day by 2030. | 6,366 | 7,074 |
| Measure S-1.2: Tiered Solid Waste Rate Structure | 65% of residential waste diverted by 2020; 75% of residential waste diverted by 2030. As of 2008, the community's diversion rate was 50% and per capita residential disposal was 4.6 lbs/day. Therefore it is assumed that disposal rates per resident will decrease to 3.2 lbs/day by 2020 and 2.3 lbs/day by 2030. The reduction potential accounts for the | 1,696 | 1,884 |

| Measure Number and Title | Assumptions | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|---|
| | incremental difference beyond the 50% required. | | |
| Measure S-1.3: Recycling Receptacles at City Buildings and Facilities | 65% of municipal waste diverted by 2020; 75% of municipal waste diverted by 2030. | <1 | 1 |
| Measure S-1.4: Construction and Demolition Waste Diversion | 65% of commercial waste diverted by 2020. Assumes construction waste was not diverted prior to 2008. | 152 | 152 |
| Measure S-1.5: Green Waste Program | 65% of waste diverted by 2020; 75% of waste diverted by 2030. Assumes no green waste was diverted prior to 2008. | 212 | 414 |
| **Strategy S-2: Decrease waste generated** | | | |
| Measure S-2.1: Municipal Purchasing Policy | 75% of purchased products environmentally preferable by 2020; 85% of purchased products environmentally preferable by 2030. | <1 | <1 |
| | ***Total Reduction from Solid Waste Measures*** | **8,427** | **9,525** |

## Table B-4. Assumptions for Community Education and Outreach Measures

| Measure Number and Title | Assumptions | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|---|
| **Strategy EO-1: Expand Community Education and Outreach** | | | |
| Measure EO-1.1: Green Page on City's Webpage | Website updated every 6 months and contains educational and financial information on CAP measures, where applicable. Target audience is the entire community of Lake Elsinore and stakeholders. Provides support for the energy, transportation and solid waste measures. | Contribute to transportation, energy, and solid waste measures. | |
| Measure EO-1.2: Quarterly Brochure with Emissions Reduction Information | 10% of households and/or businesses depending on the topic and information contained in the brochure. Provides support for the energy, transportation and solid waste measures. | Contribute to transportation, energy, and solid waste measures. | |
| Measure EO-1.3: Themed Outreach | Citywide households and businesses targeted, in combination with Measures EO-1.1 and EO-1.2. | Contribute to transportation, energy, and solid waste measures. | |

| Measure Number and Title | Assumptions | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|---|
| Measure EO-1.4: Multi-Modal Transportation Access Guide | Distributed to 10% of households with each round of publication. | Contribute to transportation waste measures. | |
| ***Total Reduction from Community Education and Outreach Measures*** | | **Not Applicable** | |
| **TOTAL REDUCTION FROM LOCAL MEASURES** | | **159,696** | **311,621** |

## B.2 State-Level Regulations Reduction Analysis Calculations

This section describes the local reductions anticipated from state-level regulations identified in the AB 32 Scoping Plan. These reductions are summarized in Table B-5.

**Assembly Bill 1493 (The Pavley Regulation).** The Scoping Plan assigns a 19.7% reduction in GHG emissions from passenger vehicles associated with the implementation of AB 1493. The Scoping Plan also notes that "AB 32 specifically states that if the Pavley regulations do not remain in effect, CARB shall implement alternative regulations to control mobile sources to achieve equivalent or greater reductions of greenhouse gas emissions (HSC §38590)." Therefore, it is reasonable to assume full implementation of AB 1493 standards, or equivalent programs that would be implemented by CARB. In addition, on April 1, 2010, the Environmental Protection Agency (EPA) and the Department of Transportation's National Highway Safety Administration announced a joint final rule establishing a national program that will dramatically reduce GHG emissions and improve fuel economy for new cars and trucks sold in the United States after 2011. Under this national program, automobile manufacturers will be able to build a single light-duty national fleet that satisfies all requirements under both the national program and the standards of California and other states. As such, Lake Elsinore may need to revisit this methodology as the federal standards become effective to ensure that vehicle standards are as aggressive as contemplated in development of this threshold.

**Low-Carbon Fuel Standard (LCFS).** The LCFS is expected to result in approximately a 10% reduction in the carbon intensity of transportation fuels used in California by the year 2020. However, a portion of the emission reductions required from the LCFS would be achieved over the lifecycle of transportation fuel production rather than from mobile-source emission factors. Based on CARB's estimate, the LCFS is estimated to result in a 7.2% reduction of mobile-source GHG emissions compared to 2020 business-as-usual conditions.

**Heavy/Medium Duty Vehicle Efficiency.** This measure requires all existing trucks and trailers to be retrofitted with the best available technology and/or CARB-approved technology. Technologies that reduce GHG emissions and improve the fuel efficiency of trucks may include devices that reduce aerodynamic drag and rolling resistance. The requirements apply to California and out-of-state registered trucks that travel to California. This regulation is expected to result in a 2.9% reduction in GHG emissions from heavy and medium vehicles compared to 2020 business-as-usual conditions.

**Passenger Vehicle Efficiency.** The Scoping Plan identifies several measures that would further reduce tailpipe GHG emissions from passenger vehicles by increasing vehicle efficiency. These measures require proper tire inflation and the use of solar-reflective automotive paint and window glazing (cool car standards). The Scoping Plan estimates that these regulations would result in a 2.8% reduction in GHG emissions from passenger vehicles compared to 2020 business-as-usual conditions.

**Senate Bill 1078, Senate Bill 107, and Senate Bill 2X (Renewables Portfolio Standard).** Established in 2002 under SB 1078, and accelerated in 2006 under SB 107, California's Renewables Portfolio Standard (RPS) required investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources by at least 1% of their retail sales annually, until they achieved 20% by 2010. SB 2X raises the target from the current 20%, requiring private and public utilities to obtain 33% of their electricity from renewable energy sources by 2020. Southern California Edison is Lake Elsinore's electricity provider. In 2008, approximately 17% of Southern California Edison's portfolio qualified under the Renewable Portfolio Standard; therefore, this regulation is expected to result in an additional 16% reduction in electricity emissions compared to 2020 business-as-usual conditions. This would result in a 21% reduction in GHG from the energy source category compared to 2020 business-as-usual conditions.

**Senate Bill 375.** The Scoping Plan estimates a five million metric ton GHG emissions reduction as a result of the regional targets for passenger vehicles and light trucks set by SB 375. The City of Lake Elsinore is located within the Southern California Association of Governments (SCAG) region. SCAG's regional targets for passenger vehicles and light trucks include an 8% per capita reduction by 2020 and a 13% per capita reduction by 2035. Although SB 375 is expected to reduce transportation-related emissions, it is not quantified as a reduction source in this CAP as the intent and implementation of SB 375 overlaps somewhat with the transportation and land-use measures included in the CAP and would likely result in the double counting of emissions reductions.

## Table B-5. State-Level Regulations

| State Regulations from Scoping Plan | End Use Sector | % Emission Reduction (Statewide) | % of Lake Elsinore Inventory Affected | % Emission Reduction from Projected Emissions | 2020 GHG Reduction Potential in Lake Elsinore (MT $CO_2e$) | 2030 GHG Reduction Potential in Lake Elsinore (MT $CO_2e$) |
|---|---|---|---|---|---|---|
| AB 1493 (Pavley) | Transportation | 19.7% | 56.3% | 11.1% | 118,167 | 225,199 |
| Low Carbon Fuel Standards | Transportation (on-road passenger/ light truck) | 7.2% | 56.3% | 4.1% | 43,647 | 83,182 |
| Low Carbon Fuel Standards | Transportation (on-road heavy/ medium duty) | 7.2% | 3.5% | 0.3% | 3,194 | 6,086 |
| Heavy/Medium Duty Efficiency | Transportation | 2.9% | 3.5% | 0.1% | 1,065 | 2,029 |
| Passenger Vehicle Efficiency | Transportation | 2.8% | 56.3% | 1.5% | 17,033 | 32,461 |
| Renewables Portfolio Standard[1] | Energy | 21.0% | 25.2% | 5.3% | 56,422 | 107,527 |
| **TOTAL Reduction from Scoping Plan Measures in Lake Elsinore** | | | | **22.5%** | **239,528** | **456,484** |

*[1]The Renewables Portfolio Standard requires the renewable energy portion of the retail electricity portfolio to be 33% in 2020. In 2008, 17% of Southern California Edison's (Lake Elsinore's provider) qualified as renewable. This regulation is expected to result in an additional 16% reduction in emissions compared to 2020 business-as-usual conditions.*

*[2] Percent reduction from 2020 inventory multiplied by Sector Percent of Lake Elsinore Inventory.*

*Source: Bay Area Air Quality Management District. California Environmental Quality Act Air Quality Guidelines; June 2010. CARB Scoping Plan, 2008.*

## Table B-6. Summary of Reductions from State-Level Regulations and Local Measures

| Reduction Area | 2020 GHG Reduction Potential (MT $CO_2e$) | 2030 GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|
| Total Reductions from Transportation and Land Use Measures | 62,138 | 124,279 |
| Total Reductions from Energy Measures | 89,131 | 177,817 |
| Total Reductions from Solid Waste Measures | 8,427 | 9,525 |
| Total Reductions from Community Education and Outreach Measures | Contributes to other measures | Contributes to other measures |
| Total Reduction from State-Level Regulations | 239,528 | 456,484 |
| **TOTAL REDUCTION FROM MEASURES (MT $CO_2E$)** | **399,224** | **768,105** |
| **TOTAL REDUCTION PER SERVICE POPULATION (MT $CO_2E$/SP)** | **2.8** | **2.5** |

## Table B-7. Reductions Relative to Targets

| | 2020 (MT $CO_2e$) | 2020 (MT $CO_2e$/ SP[1]) | 2030 (MT $CO_2e$) | 2030 (MT $CO_2e$/SP) |
|---|---|---|---|---|
| Total Projected Business-as-Usual Emissions | 1,064,565 | 7.4 | 2,028,819 | **6.7** |
| Total Reduction from State and Local Measures | 399,224 | 2.8 | 768,105 | 2.5 |
| Total Projected Emissions with CAP | 665,341 | 4.6 | 1,260,714 | 4.2 |
| Greenhouse Gas Emissions Target | 944,737 | 6.6 | 1,334,243 | 4.4 |
| **Amount Exceeding Target** | **279,396** | **2.0** | **73,529** | **0.2** |

[1] SP = Service Population; 2020 service population = 143,142; 2030 service population = 303,237

# Appendix C

*Cost and Savings Data*

# Appendix C: Cost and Savings Data

This appendix details the methodology, information sources, and assumptions for the cost and savings estimates included in the CAP. Costs are generally presented as first year costs and account for the expense that would occur beyond conducting business-as-usual (i.e., without implementation of the CAP). The cost and savings data are based on research conducted by ICLEI (Local Governments for Sustainability), market research, and the experience of similar cities and local developers. For each measure, potential costs and savings to the City, residents and businesses are categorized as low, medium, and high. These categories correspond to a range, as shown in the table below, as costs for each measure are highly variable.

**Measure Cost and Savings**

| Cost/Savings Type | | Range |
|---|---|---|
| City Cost | Low: | $0 - $10,000 |
| | Medium: | $10,001 - $100,000 |
| | High: | $100,001 or greater |
| Private Cost | Low: | $0 - $1,000 |
| | Medium: | $1,001 - $5,000 |
| | High: | $5,001 or greater |
| Private Savings | Low: | $0 - $1,000 |
| | Medium: | $1,001 - $5,000 |
| | High: | $5,001 or greater |

## Table C-1. Cost and Savings Data for Transportation and Land Use Measures

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/Assumptions |
|---|---|---|---|---|
| **Strategy T-1: Increase bicycle, pedestrian and public transit mode share** | | | | |
| **Measure T-1.1: Safe Routes to School**. Continue to pursue and utilize grant funding when needed to construct safe pedestrian and bicycle routes within a two mile radius of schools where applicable. | no new cost | none | low | CITY COSTS: Minimal additional time from City Planning and Public Works staff. Assumed that projects/programs would be funded by grant monies. PRIVATE SAVINGS: Increased walking/bicycling to schools would reduce automobile use and associated costs. The 2011 standard mileage rate for the use of a car is $0.51/mile (Internal Revenue Service [IRS], January 2011). One student walking or biking to school instead of traveling by car would result in a savings of approximately $184/year (assuming the student lives one mile from school and attends school 180 days out of the year). |
| **Measure T-1.2: Pedestrian Infrastructure.** Through the development review process, require the installation of sidewalks along new and reconstructed streets. Also require new subdivisions and large developments to provide sidewalks or paths to internally link all uses where applicable and provide connections to neighborhood activity centers, major destinations, and transit facilities contiguous with the project site; implement through conditions of approval. | low | high | medium to high | CITY COSTS: There would be minimal additional costs associated with staff time needed as part of City staff's standard practices in project review and approval processing; however, this cost will be absorbed through development/permitting fees. PRIVATE COSTS: The cost per mile of sidewalk or bicycle path is approximately $5,000. Source: Alta Planning. PRIVATE SAVINGS: Increased walking would reduce automobile use and associated costs. The cost to own and operate a medium-sized car is approximately $8,500 per year or $0.51 per mile. Source: American Automobile Association; IRS, January 2011. |
| **Measure T-1.3: Street and Sidewalk Maintenance and Improvements.** Continue, through the Pavement Management and Curb, Gutter, and Sidewalk Repair programs, to preserve the pedestrian and bicycle circulation system by identifying and | no new cost | none | medium to high | CITY COSTS: No additional cost for City. PRIVATE SAVINGS: Increased walking/bicycling would reduce automobile use and associated costs. The cost to own and operate a medium-sized car is approximately $8,500 per year or $0.51 per mile. Source: American Automobile Association; IRS, January 2011. |

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/Assumptions |
|---|---|---|---|---|
| scheduling street and sidewalk improvement and maintenance projects. | | | | |
| **Measure T-1.4: Bicycle Infrastructure**. Through the development review process, require new development, as applicable, to implement and connect to the network of Class I, II and II bikeways, trails and safety features identified in the General Plan, Bike Lane Master Plan, Trails Master Plan and Western Riverside County Non-Motorized Transportation plan; implement through conditions of approval. The City will also continue to pursue and utilize funding when needed to implement portions of these plans. | | | | CITY COSTS: There would be minimal additional costs associated with staff time needed as part of City staff's standard practices in project review and approval processing; however, this cost will be absorbed through development/permitting fees. PRIVATE COSTS: Cost of infrastructure development is highly variable. Cost estimates for bike infrastructure: Class I Bike Path - $1,000,000 - $2,000,000 per mile; Class II Bike Lanes - $10,000 - $1,000,000 per mile (depending on level of roadway improvement required); Class III Bike Routes - $2,000 - $60,000 per mile (depending on level of treatment: route signage only would be lower end, signage and shoulder striping, pavement markings, signal actuation would be higher end). Source: Alta Planning. PRIVATE SAVINGS: Increased bicycling would reduce automobile use and associated costs. The cost to own and operate a medium-sized car is approximately $8,500 per year or $0.51 per mile. Source: American Automobile Association; IRS, January 2011. |
| **Measure T-1.5: Bicycle Parking Standards**. Through the development review process, enforce the following short-term and long-term bicycle parking standards for new non-residential development (consistent with 2010 California Green Building Code [CalGreen], Section 5.106.4), and implement through conditions of approval<br>• *Short-Term Bicycle Parking:* If the project is anticipated to generate | none | no new cost | medium to high | CITY COSTS: Standards adopted in 2011 as part of CalGreen requirements. PRIVATE COSTS: This is now a cost associated with doing business-as-usual as it is required under the CalGreen standards that went into effect January 2011. PRIVATE SAVINGS: Increased bicycle use would reduce vehicle miles traveled and associated fuel and vehicle costs to private residents. The cost to own and operate a medium-sized car is approximately $8,500 per year or $0.51 per mile. Sources: American Automobile Association; IRS, January 2011. |

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/Assumptions |
|---|---|---|---|---|
| visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitor entrance, readily visible to passers-by, for 5% of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack.<br>• *Long-Term Bicycle Parking*: For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5% of tenant-occupied motorized vehicle parking capacity, with a minimum of one space. | | | | |
| **Measure T-1.6: Public Transit Incentives.** Coordinate with the Riverside Transit Agency to implement regional transit strategies in Lake Elsinore, expand transit routes, and provide public transit incentives to residents and employees, such as free or reduced-cost monthly transit passes. | low | none | low to medium | CITY COSTS: Annual cost of 40 hours of City Planning and Public Works staff time to coordinate with regional transit providers ($2,000 - $4,000). Costs associated with promoting incentives included in education and outreach measures. PRIVATE SAVINGS: Savings from public transit incentives, such as discounted transit passes, and increased transit use would reduce vehicle miles traveled and associated fuel and vehicle costs to private residents. The cost to own and operate a medium-sized car is approximately $8,500 per year or $0.51 per mile (American Automobile Association; IRS, January 2011). |
| **Strategy T-2: Manage vehicle parking** | | | | |
| **Measure T-2.1: Designated Parking for Fuel-Efficient Vehicles.** Revise the Municipal Code to require that new non-residential development designate 10% of total parking spaces for any combination of low-emitting, fuel-efficient and carpool/vanpool | none | low to medium | medium | CITY COSTS: Minimal additional time for City Public Works staff to adopt CalGreen standard. There would be minimal additional costs associated with staff time needed for plan checks; however, this cost will be absorbed through standard fees. PRIVATE COSTS: Initial capital investment ($500 - $1,000) to mark stalls and maintain paint. PRIVATE SAVINGS: Ridesharing |

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/Assumptions |
|---|---|---|---|---|
| vehicles (consistent with CalGreen Tier 1, Sections A5.106.5.1 and A5.106.5.3), and implement through conditions of approval. Parking stalls shall be marked "Clean Air Vehicle." | | | | and increased use of low-and zero-emissions vehicles save residents/employees money due to reduced fuel use. Savings depend on degree of implementation and current fuel prices. Ridesharing with 1 person would save approximately $1,700 per year. Source: Commute Cost Calculator. www.commutesmart.info/commute-cost-calculator.asp |
| **Strategy T-3: Increase in efficiency of land-use patterns** | | | | |
| **Measure T-3.1: Mixed-Use, High Density, Infill and Transit Oriented Development.** As part of the General Plan Update process, revise the Land Use Map and Municipal Code to allow for and/or increase the amount of mixed-use, high density, infill and transit oriented development. Mixed-use projects should be targeted in the Historic and Ballpark Districts, as well as other areas where services are within walking distance. High density projects should be located in urbanized areas adjacent to services and transportation. Update the Municipal Code for consistency between zoning regulations and General Plan land use designations. | none | none | none | CITY COSTS: This cost would be included as part of the General Plan Update and Municipal Code update following adoption of the General Plan. |
| **Measure T-3.2: Mixed-Use, Infill, and Transit Oriented Development Incentives**. Identify and provide incentives to promote mixed-use, infill and transit oriented development, such as: a streamlined permitting process, less restrictive parking requirements, less restrictive height limits, lower permit fees | low | none | medium | CITY COSTS: Costs would vary based on the degree of incentives provided; additional time (~100 hours) for City Planning and Public Works staff to determine standards (approximately $10,000). Costs may be reduced by drawing on incentives for mixed-use and high density development identified in the Housing Element. PRIVATE SAVINGS: Savings associated with reduced parking requirements or height limits, or lower fees for building owners/developers. The |

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/Assumptions |
|---|---|---|---|---|
| and/or reduced impact fees. | | | | average cost of developing a surface lot parking space is between $2,000 and $5,000, with ongoing maintenance costs. Source: City of West Hollywood Climate Action Plan, 2010. |
| **Measure T-3.3: Density Bonus Incentive.** Amend the Municipal Code to allow for a Density Bonus Incentive for a residential project that is located within 1,500 feet from a regular bus stop or rapid transit system stop; is located within a quarter mile from a public park or community center; or is located within a half mile from school grounds/facilities open to the general public, a full-service grocery store, hospital, medical clinic, or pharmacy. | none | none | medium to high | CITY COSTS: This cost would be included as part of the General Plan Update and Municipal Code update following adoption of the General Plan. PRIVATE SAVINGS: Savings associated with an increase in allowable units for developers. |
| **Measure T-3.4: Neighborhood Commercial Centers**. Identify potential neighborhood commercial center sites and rezone identified areas to Neighborhood Commercial as part of the General Plan Update. | none | none | none | CITY COSTS: This cost would be included as part of the General Plan Update and Municipal Code update following adoption of the General Plan. |
| **Strategy T-4: Reduce vehicle trips** | | | | |
| **Measure T-4.1: Commute Trip Reduction Program**. Institute a commute trip reduction program for employers with fewer than 100 employees (below the requirements of the existing Transportation Demand Management Program). Provide information, training, and incentives to encourage participation. | low to medium | low | low to medium | CITY COSTS: Up-front costs related to program implementation (through existing Transportation Demand Management Program) as well as development and distribution to businesses of information, training, and incentives. Approximately 100 hours of staff time (approximately $10,000). PRIVATE SAVINGS: Individual employees save money due to reduced travel time and associated costs. Savings depend on current fuel prices. |

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/Assumptions |
|---|---|---|---|---|
| **Strategy T-5: Increase the use of low- and zero-emissions vehicles** | | | | |
| **Measure T-5.1: Hybrid and Fuel-Efficient Vehicle Incentives.** Facilitate the voluntary replacement of inefficient vehicles with hybrids, plug-in electric, and other low- and zero-emissions vehicles by connecting residents and businesses with technical and financial assistance through the City's website. | low | medium | low to medium depending on incentives | CITY COSTS: Additional time from City Planning and Public Works staff; costs combined with Measure EO-1.1. PUBLIC COST/SAVINGS: Hybrid vehicles cost approximately $3,000 to $5,000 more than similarly-sized counterparts (www.consumeraffairs.com). Smaller vehicles would generally be less expensive than larger vehicles. Both hybrid vehicles and smaller vehicles are less expensive to operate than larger, non-hybrid vehicles. Savings depend on current fuel prices and available rebates/incentives. |
| **Measure T-5.2: Municipal Fleet Vehicle Purchasing Policy**. Develop and adopt a low- and zero-emissions replacement/purchasing policy for new and replaced official City vehicles and equipment. | low | none | none | CITY COSTS: Cost would be incurred as with standard City vehicle replacement. Hybrid vehicles cost approximately $3,000 to $5,000 more than similarly-sized counterparts (www.consumeraffairs.com). Smaller vehicles would generally be less expensive than larger vehicles. Both hybrid vehicles and smaller vehicles are less expensive to operate than larger, non-hybrid vehicles. Assuming replacement of two City fleet vehicles per year, costs would not generally exceed $10,000 per year. Savings depend on current fuel prices and available rebates/incentives. |

## Table C-2. Cost and Savings Data for Energy Measures

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/ Assumptions |
|---|---|---|---|---|
| **Strategy E-1: Increase energy efficiency of new construction** | | | | |
| **Measure E-1.1: Tree Planting Program.** Through the development review process, require new development to plant at minimum one 15-gallon non-deciduous, umbrella-form tree per 30 linear feet | none | no new cost | low | CITY AND PRIVATE COSTS: As this program is already in place, no new costs would result beyond doing business as usual. PRIVATE SAVINGS: Although the benefits of urban forestry can vary considerably by community and tree species, a study of urban forestry programs in five U.S. cities showed |

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/ Assumptions |
|---|---|---|---|---|
| of boundary length near buildings, per the Municipal Code. Trees shall be planted in strategic locations around buildings or to shade pavement in parking lots and streets. | | | | the benefits are almost always higher than the costs. The study found that, on a per-tree basis, the cities accrued benefits ranging from about $1.50 – $3.00 for every dollar invested. These cities spent roughly $15 – $65 annually per tree, with net annual benefits ranging from approximately $30 – $90 per tree. (McPherson, et al in USEPA 2009). |
| **Measure E-1.2: Cool Roof Requirements.** Amend the City Municipal Code to require new non-residential development to use roofing materials having solar reflectance, thermal emittance or Solar Reflectance Index (SRI)3 consistent with CalGreen Tier 1 values (Table A5.106.11.2.1), and implement through conditions of approval. | none | medium to high | high | CITY COST: Minimal up-front cost of adopting the standard, which is detailed in the California Green Building Code. There would be minimal additional costs associated with staff time needed for plan checks; however, this cost will be absorbed through development/permitting fees. PRIVATE COSTS: Although costs will vary greatly depending on location and local circumstances, cool roof coatings on a low-slope roof might cost $0.75 – $1.50 per square foot, while single-ply cool roof membrane costs vary from $1.50 – $3.00 per square foot. The cost premium for cool roofs versus conventional roofing materials ranges from zero to $0.05 – $0.10 per square foot for most products, or from $0.10 – $0.20 for a built-up roof with a cool coating used in place of smooth asphalt or aluminum coating. Source: Levinson, R., H. Akbari, S. Konopacki, and S. Bretz. 2002. Inclusion of Cool Roofs in Nonresidential Title 24 Prescriptive Requirements. PRIVATE SAVINGS: A California study found that cool roofs provide an average yearly net savings of almost $0.50 per square foot. This number includes the price premium for cool roofing products and increased heating costs in the winter as well as summertime energy savings, savings from downsizing cooling equipment, and reduced labor and material costs over time due to the longer life of cool roofs compared with conventional roofs. Source: Lawrence Berkeley National Laboratory, 2009 |

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/ Assumptions |
|---|---|---|---|---|
| **Measure E-1.3: Energy Efficient Building Standards.** Adopt an ordinance requiring that all new construction exceed the California Energy Code requirements, based on the 2008 Energy Efficiency Standards by 15% (consistent with CalGreen Tier 1), through either the performance based or prescriptive approach described in the California Green Building Code; implement through conditions of approval. Alternately, a solar photovoltaic system and/or solar water heating may be used to assist in meeting all or a portion of the 15% requirement. | low | medium to high | low to medium | CITY COSTS: Additional time (~10 hours) for staff to amend Municipal Code (approximately $1,000). There would be minimal additional costs associated with staff time needed for plan checks; however, this cost will be absorbed through development/permitting fees. PRIVATE COSTS: Costs will vary based on the size and design of the building and site. The initial capital cost of implementing basic, cost-effective energy conservation measures, which achieve an average of ~15% energy efficiency improvement for a representative 2,000 sq ft house would be $1,000 - $2,000, with a per unit initial capital cost of $0.50 - $1.00/sq ft. These energy conservations include (an will vary depending on the type of building): attic and duct insulation, high efficiency windows, high efficiency heating and cooling system, high efficiency lighting, Energy Star washer, dishwasher, and refrigerator, and code compliant hot water boiler. Rebates and financing options are available to offset costs. For a representative 10,000 sq ft commercial building, the initial cost of implementing basic cost-effective energy efficiency measures to achieve a 15% reduction would be $20,000 - $35,000, or $2.00 - $3.50/sq ft. These measures include: high efficiency heating and cooling system, variable frequency drives, high efficiency lighting systems, lighting controls, low flow fixtures, and high efficiency hot water boiler. Southern California Edison along with the California Advanced Homes builder and buyer program, provides design assistance, education and financial support to help industry meet the CalGreen tiered standards. PRIVATE SAVINGS: Average annual savings for the residential example: $200 - $600, or $0.10 - $0.30/sq ft. Average annual savings for the commercial example: $2,500 - $5,000, or $2.50 - |

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/ Assumptions |
|---|---|---|---|---|
| | | | | $4.00/sq ft. Sources: Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings; Yolo County Climate Action Plan, 2011; California Energy Commission, 2008 Building Energy Efficiency Standards for Residential and Nonresidential Buildings. |
| **Strategy E-2: Increase energy efficiency of existing buildings** | | | | |
| **Measure E-2.1: Energy Efficiency Upgrades and Retrofits.** Facilitate voluntary energy efficiency upgrades and retrofits in existing residential, commercial and industrial buildings by connecting residents and businesses with technical and financial assistance through the City website. | low | medium to high | medium to high | CITY COSTS: City Planning and Public Works staff time. Assumes $10,000 per campaign for strategies-related marketing, which can be coupled with costs for measure E-1.1; 2 campaigns per 10-year period = $20,000 total. PRIVATE COSTS: Costs will vary based on the size and design of the building and site. The initial capital cost of implementing basic, cost-effective energy conservation measures, which achieve an average of ~20% energy efficiency improvement for a representative 2,000 sq ft house would be $1,500 - $2,000, or $0.75 - $1.00/sq ft. These improvements include attic and duct insulation, high efficiency heating system, low-flow plumbing fixtures, and high efficiency lighting. The owner could leverage additional rebate and financing options to offset some costs. For a representative 10,000 sq ft commercial building, the initial cost of implementing basic cost-effective energy efficiency measures to achieve ~20% energy efficiency improvements would be $40,000 - $100,000, or $4 - $10/sq ft. These measures include: high efficiency heating and cooling system, variable frequency drives, high efficiency lighting systems, lighting controls, low flow fixtures, and high efficiency hot water boiler. The owner could leverage additional rebate and financing options to offset some costs.<br>PRIVATE SAVINGS: Average annual savings for the |

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/ Assumptions |
|---|---|---|---|---|
| | | | | residential example: $1,500 - $2,000, or $0.15 - $0.20/sq ft. Average annual savings for the commercial example: $5,000 - $15,000, or $0.50 - $1.50/sq ft. Source: Yolo County Climate Action Plan, 2011; Residential; California Energy Efficiency Consumer Energy Center www.consumerenergycenter.org). |
| **Measure E-2.2: Green Business Certification Program**. Establish and administer a voluntary Green Business Certification Program to recognize businesses that voluntarily develop and implement energy conservation programs, including energy efficiency improvements, energy-efficient heating and cooling systems, and co-generation systems (e.g., solar energy arrays). | low | low to medium depending on implementation | medium | CITY COST: Initial cost to develop program (approximately 40 hours, or $2,000 - $4,000). Additional Planning and Public Works staff time to administer program (approximately 40 additional hours annually, $2,000 - $4,000). PRIVATE COSTS/ SAVINGS: A green business program may allow local businesses to join and leverage increased purchasing power or apply for grant monies in order to implement energy-efficiency measures, alternative energy strategies, or other emissions-reducing programs in a more cost-effective manner. Private energy savings could be in excess of $1,525 annually per business, depending on implementation costs, size and type of business. Source: CAPPA. |
| **Measure E-2.3: Compact Fluorescent Light Bulb (CFL) Distribution Program**. Partner with Southern California Edison or a local business to sponsor a CFL distribution program; distribute at least 4,000 CFLs. | none to low | high | high | CITY OR PRIVATE (UTILITY) COST: The cost per CFL is estimated at $2.58. Source: CAPPA. The City could partner with the utilities to implement the program. PRIVATE SAVINGS: Each CFL is estimated to save approximately $4.81 per year, using 75% less energy than incandescent bulbs. Source: CAPPA |
| **Strategy E-3: Increase energy efficiency of municipal buildings and facilities 15% by 2020 and 20% by 2030** | | | | |
| **Measure E-3.1: City HVACs.** Upgrade the HVAC systems at City facilities to reduce overall energy use. | low | none | none | CITY COST/ SAVINGS: The incremental cost of efficient HVAC units is estimated at $0.02 per square foot. Source: CAPPA. Improved HVAC units are assumed to save $0.04 per year per square foot. |

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/ Assumptions |
|---|---|---|---|---|
| **Measure E-3.2: Energy Efficient Street and Traffic Signal Lights.** Work with Southern California Edison to replace existing high pressure sodium street lights and traffic lights with high efficiency alternatives, such as Low Emitting Diode (LED) lights. Replace existing City owned traffic lights with LED lights. Require any new street and traffic lights to be LED and implement through conditions of approval. | none | high | high | PRIVATE (UTILITY) COST/SAVINGS: LED streetlights have an incremental cost of approximately $500, although this is anticipated to decrease as LED technology advances. Source: LEDs Magazine. However, LED street lights have reduced maintenance costs and lower energy requirements as compared to traditional street lights. Source: PG&E. It is assumed that LED streetlights would replace traditional streetlights as part of Southern California Edison's standard replacement schedule, amortizing costs over an approximately 20-year period. |
| **Measure E-3.3: Street Light Automatic Daylighting Control Devices.** Work with Southern California Edison to install astronomical time-switch controls on street lights that automatically turns off the outdoor lighting when daylight is available. | none | none (complete) | high | PRIVATE (UTILITY) COST/SAVINGS: Completed between 2009 and 2011. Savings from reduced energy use are estimated at $28,750. Source: CAPPA. |
| **Measure: E-3.4: Energy Efficient Lights, Ballasts, and Occupancy Sensors at City Facilities.** Install energy efficient lights, ballasts and occupancy sensors at all City facilities. | none (complete) | none | none | CITY COSTS: Completed between 2009 and 2011. CITY SAVINGS: Savings from reduced energy use are estimated at $9,644. Source: CAPPA. |
| **Measure E-3.5: Municipal Energy Efficiency Upgrades and Purchasing Standards**. Develop and adopt an energy efficient replacement/ purchasing policy for City equipment and appliances (i.e., lights, computers, low-flow toilets and faucets, etc.). | low | none | none | CITY COST: Upfront cost to develop purchasing standards (approximately $2,500 - $5,000). Incremental costs of energy efficient purchases: ENERGY STAR appliances as $0 for computers, monitors, and water coolers; $10 for printers and copiers; $30 for refrigerators, $910 for electric water heaters, and $1,150 for natural gas water heaters. The CAPPA tool estimates fixture costs at $9/faucet, |

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/ Assumptions |
|---|---|---|---|---|
| | | | | $29/shower head, and $448/toilet. Including energy- and water-efficient appliances and fixtures in the City's equipment replacement program would be expected to yield long-term cost savings based on decreased energy and water use. CITY SAVINGS: The annual savings of switching to ENERGY STAR equipment at City facilities would likely exceed $10,000 depending on the degree of implementation. |
| **Strategy E-4: Reduce water consumption** | | | | |
| **Measure E-4.1: Landscaping Ordinance**. Through the development review process, enforce the City's Assembly Bill 1881 Landscaping Ordinance; implement through conditions of approval. | none - complete | no new cost | low to medium | PUBLIC COSTS/SAVINGS: Costs and water savings will vary depending on the landscaping/water efficiency improvements implemented. |
| **Measure E-4.2: Indoor Water Conservation Requirements.** Amend the City's Uniform Building Code to require development projects to reduce indoor water consumption by 30% (consistent with CalGreen Tier 1, Section A5.303.2.3.1), and implement through conditions of approval. | none | low to high | low to medium | CITY COSTS: Minimal up-front cost to amend the Building Code with already developed CalGreen standards. PUBLIC COSTS/SAVINGS: Costs and water savings will vary depending on the degree of implementation. High-efficiency fixtures, such as shower heads, faucets, and toilets are generally similar in price to standard fixtures. The United States EPA estimates fixture costs at $9/faucet, $29/shower head, and $448/toilet. The Department of Water and Power and Southern California Edison offer incentives/rebates to assist, such as $300 for a high efficiency clothes washer and $100 for high efficiency toilet. |
| **Strategy E-5: Increase renewable energy opportunities** | | | | |
| **Measure E-5.1: Renewable Energy Incentives**. Facilitate the voluntary installation of small-scale renewable energy systems, such as solar photovoltaic (PV) and solar hot water systems, by connecting residents and | low | medium to high | medium to high | CITY COSTS: City Planning/Building Department staff expense to identify and remove regulatory barriers. Assumes $10,000 per campaign for strategies related to marketing, which can be coupled with costs for measure E-2.1. 2 campaigns per 10-year period = $20,000 total. PRIVATE COSTS/SAVINGS: |

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/ Assumptions |
|---|---|---|---|---|
| businesses with technical and financial assistance through the City website. The City will also revise the permit processes and fees as appropriate to remove barriers to and incentivize the installation of renewable energy systems, in accordance with applicable safety and environmental standards. | | | | Residential cost of solar PV system: $8/watt installed ($8,000/kW installed), though there is a downward trend in cost that can be expected to continue for at least the near term future. Both federal and state tax credits are available, which total approximately 35%. The cost for a hypothetical 3-kW system (~300 sq ft of roof space) is $24,000 total cost, but $15,000 with rebates. The total cost of a solar hot water heater, including installation and administration is approximately $3,000 ($2,100 with rebate). The cost of financing a solar system could be moderately reduced if group discounts were negotiated with a solar installer/contractor. The building owner could leverage other incentives: $1.55-$2.10/watt installed -California Solar Initiative incentives for homeowners in investor-owned utility territories (including Southern California Edison) to install photovoltaic systems. There is also a federal tax credit of 30% on the total cost of the installed system. Federal tax incentives for solar hot water are 30% of installation cost. A solar thermal system reduces hot water bill from 50 to 100%. Savings will vary considerably. Source: California Solar Initiative. |

## Table C-3. Cost and Savings Data for Solid Waste Measures

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/ Assumptions |
|---|---|---|---|---|
| **Strategy S-1: Increase solid waste diversion** | | | | |
| **Measure S-1.1: Commercial Recycling.** Renegotiate contract with waste provider to require curbside recycling for all commercial land uses to divert 65% of commercial solid waste by 2020 and 75% of commercial solid waste by 2030. | low | low | none | CITY COSTS: Up-front costs of renegotiation/ coordination with the City's franchise trash hauler and ongoing costs associated with program management. City contribution toward costs associated with providing recycling services to business (approximately $5,000 - $10,000). PRIVATE COSTS: California recently made commercial recycling mandatory with a 50% reduction in commercial solid waste. Waste collection rates would be expected to increase based on the increase to 65%. This cost is expected to be borne by a combination of the City and local business. |
| **Measure S-1.2: Tiered Solid Waste Rate Structure**. Renegotiate contract with waste provider to implement a tiered rate structure for residential waste; divert 65% of residential solid waste by 2020 and 75% of residential solid waste by 2030. | low | low | low | CITY COSTS: Up-front cost of coordination with the City's franchise trash hauler. PRIVATE COSTS: Residents will incur a cost based on the volume of waste they produce. The total costs to City residents is not expected to exceed existing costs, but the distribution of costs among residents would shift such that residents that produce more waste would pay a higher cost for waste collection. Correspondingly, residents that produce less waste would pay a lower cost for waste collection. |
| **Measure S-1.3: Recycling Receptacles at City Buildings and Facilities.** Provide recycling containers at all City buildings and facilities and to all employees; divert 65% of municipal solid waste by 2020 and 75% of municipal solid waste by 2030. | low | none | none | CITY COSTS: Up-front cost of individual recycling receptacles not anticipated to exceed $100. Ongoing costs associated with emptying and replacing receptacles would be included in existing waste facilities maintenance costs. |

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/ Assumptions |
|---|---|---|---|---|
| **Measure S-1.4: Construction and Demolition Waste Diversion**. Amend the Municipal Code to require development projects to divert to recycle or salvage nonhazardous construction and demolition debris generated at the site, resulting in at least a 65% reduction by 2020 (consistent with CalGreen Tier 1, Section A5.408.3.1). Require all new projects to be accompanied by a waste management plan for the project and a copy of the completed waste management report shall be provided upon completion. | low | medium | none | CITY COSTS: Up-front cost of coordination with the City's franchise trash hauler. Ongoing costs associated with required data collection and monitoring, assumed to already be included in the cost of doing business-as-usual per CalGreen's 50% requirement. PRIVATE COSTS: Future development is already required to divert 50% of construction waste and prepare a waste management plan under the 2008 California Green Building Code, but will incur a cost increase for their proportion of reused/recycled materials. |
| **Measure S-1.5: Green Waste Program.** Renegotiate contract with waste provider to provide green waste bins that split off the green waste from the trash stream. | no new cost - complete | none | none | CITY COST: None, as the program was recently completed. |
| **Strategy S-2: Decrease solid waste generated** | | | | |
| **Measure S-2.1: Municipal Purchasing Policy.** Develop and adopt an Environmentally Preferable Purchasing policy for municipal operations. | low | none | none | CITY COSTS: Minimal up-front facilities coordination costs and minimal ongoing costs associated with purchasing program maintenance (approximately $2,500 - $5,000). |

## Table C-4. Cost and Savings Data for Community Education and Outreach Measures

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/ Assumptions |
|---|---|---|---|---|
| **Strategy EO-1: Expand Community Education and Outreach** | | | | |
| **Measure EO-1.1: Green Page on City's Website**. Create and regularly maintain a "green" page on the City's website to provide educational materials, and information of incentive programs and rebates. | low | none | none | CITY COSTS: Up-front development and hosting costs not anticipated to exceed $5,000, with ongoing maintenance costs expected to be lower. PRIVATE COSTS/SAVINGS: No direct costs would result; however, this page would inform residents and businesses about potential savings opportunities. |
| **Measure EO-1.2: Quarterly Brochure with Specific Emissions Reduction Information.** Create a quarterly brochure to distribute to residents and business providing educational information, information about what the City is doing to reduce emissions, ways for the public and businesses to reduce emissions, and incentive and rebate programs. Each quarter will cover a different topic. Topics include Energy Efficiency and Conservation, Alternative Energy, Transportation, Solid Waste Reduction and Recycling, Water Conservation, Mixed-Use and Transit Oriented Development, and Green Building. A portion of each brochure can be used to recognize and publicize actions that local businesses have taken and new developments that implement CAP actions for the particular topic. Distribute via email and at City counters. | low | none | none | CITY COSTS: Costs include identifying City employees to lead this program and locate/develop content for inclusion in brochure. Associated costs not estimated to exceed $3,000. PRIVATE COSTS/ SAVINGS: No direct costs would result to residents or businesses. Savings could result for local green businesses recognized in the mailer. |

| Measure Number and Title | City Cost | Private Cost | Private Savings | Economics Notes/ Assumptions |
|---|---|---|---|---|
| **Measure EO-1.3: Themed Outreach.** Promote different methods for reducing GHG emissions throughout the year. Themes should be integrated into one event each year, as well as the City website, quarterly mailers, informational kiosks, and displays at City facilities. Example themes include: energy efficiency (e.g., partner with local contractors to hold workshops and demonstrations about home and office weatherization techniques and other ways that reduce energy consumption within a home or office) and alternative transportation (e.g., create a cycling and walking commute campaign, or hold cycling and walking events and activities, particularly on trails and cycling routes). | medium | low | low | CITY COSTS: Costs will consist of event hosting, operation, and promotion (approximately $10,000-$20,000 per event). Promotion should be coordinated with implementation of Measures EO-1.1 and EO-1.2 in order to reduce total costs. PRIVATE COSTS/ SAVINGS: Private costs will consist of participation costs of local businesses and organizations, which are expected to include green businesses, nonprofit organizations, and other businesses that provide related services, including energy retrofitting, alternative transportation options such as bicycles or low-emissions vehicles, etc. Private savings could result from items such as energy efficiency giveaways. |
| **Measure EO-1.4: Multi-Modal Transportation Access Guide**. Produce a Multi-Modal Transportation Access Guide, which concisely describes and provides maps on how to reach a major destination in Lake Elsinore by foot, bicycle, transit, rideshare, etc. This information can be provided online, at City buildings, and major destinations in Lake Elsinore. | low | none | none | CITY COSTS: Up-front costs associated with Public Works developing and producing required materials, including maps and user-friendly graphics. Ongoing costs associated with production and distribution of the guide, as well as regular updates based on changes to local transportation infrastructure. Estimated at $8,000 - $10,000. PRIVATE SAVINGS: No direct savings; however, residents with improved access to information on alternative transportation options would be enabled to reduce their overall transportation costs. |

## Table C-5. Cost and Savings Data for CAP Monitoring

| | City Cost | Private Cost | Private Savings | Economics Notes/ Assumptions |
|---|---|---|---|---|
| Monitoring and reporting on individual measures | low | none | none | CITY COSTS: Approximately 30 hours at a rate of $50-$100/hour = $1,500 to $3,000. |
| 5-year GHG emissions inventory update | low | none | none | CITY COSTS: Approximately 40 hours at a rate of $50-$100/hour = $2,000 to $4,000. |

# Appendix D

*Project-level CAP Consistency Worksheet*

# Appendix D: Project-Level CAP Consistency Worksheet

The City of Lake Elsinore Climate Action Plan (CAP) is a comprehensive and program-level document to ensure that the City reduces community-wide GHG emissions consistent with AB 32 and Executive Order S-3-05. Once the CAP is adopted following environmental review, later projects consistent with the General Plan growth potential and CAP may tier from and/or incorporate the CAP by reference in their cumulative GHG impact analyses. This appendix is a project level worksheet that an applicant may use to demonstrate consistency with the General Plan growth potential and CAP. In addition, project-level GHG emissions impact analyses can utilize the California Emissions Estimator Model (CalEEMod), or other appropriate software, to determine compliance[1].

1. Is the project consistent with the General Plan land use designation?

2. Is the project consistent with the General Plan population and employment projections for the site, upon which the CAP modeling is based?

3. Does the project incorporate the following CAP measures as binding and enforceable components of the project? Until these measures have been formally adopted by the City and incorporated in to applicable codes, the requirements must be incorporated as mitigation measures applicable to the project (CEQA Guidelines, Section 15183.5(b)(2)).

**T-1.2 Pedestrian Infrastructure**

- Does the project provide sidewalks along new and reconstructed streets?
- Does the project provide sidewalks or paths to internally link all uses in a project where applicable?
- Does the project provide connections to neighborhood activity centers, major destinations, and transit contiguous to site?

**T-1.4 Bicycle Infrastructure**

- Where applicable, does the project implement the network of Class I, II and II bikeways, trails and safety features identified in the General Plan, Bike Lane Master Plan, Trails Master Plan and Western Riverside County Non-Motorized Transportation plan?
- Does the project, where applicable, provide connections to the network identified in those plans?

[1] CalEEMod was created by the South Coast Air Quality Management District (SCAQMD) in collaboration with the other California Air Districts to provide an accurate and comprehensive tool for quantifying GHG impacts from land use projects throughout California. This model is available for public download on CalEEMod's website located at http://www.caleemod.com/.

**T-1.5 Bicycle Parking**

- Does new, non-residential development that is anticipated to generate visitor traffic provide permanently anchored bicycle racks within 200 feet of the visitor entrance, readily visible to passers-by, for 5% of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack?
- Does the development propose a building with over 10 tenant spaces? If so, does it provide secure bicycle parking for 5% of tenant-occupied motorized vehicle parking capacity, with a minimum of one space?

**T-2.1 Designated Parking for Fuel-Efficient Vehicles**

- Does a non-residential development designate 10% of its total parking spaces for "Clean Air Vehicles?"

**E-1.1 Tree Planting**

- Does the developer provide a 15-gal non-deciduous, umbrella-form tree per 30 linear feet of boundary length, near buildings, or to shade pavement in parking lots and streets?

**E-1.2 Cool Roof Requirements**

- Does the new non-residential development use roofing materials having solar reflectance, thermal emittance or Solar Reflectance Index 3 per CalGreen Tier 1 values?

**E-1.3 Energy Efficient Building Standards**

- Does new construction achieve CalGreen Tier 1 energy efficiency standards?

**E-3.2 Energy Efficient Street and Traffic Signal Lights**

- Does the project involve the installation of street or traffic signal lights? If so, are they Low Emitting Diode (LED) lights?

**E-4.1 Landscaping**

- Does the development comply with the City's AB 1881 Landscaping Ordinance?

**E-4.2 Indoor Water Conservation Requirements**

- Does the development reduce indoor water consumption by 30%, consistent with CalGreen Tier 1, Section A5.303.2.3.1?

**S-1.4: Construction and Demolition Waste Diversion**

- Is the project accompanied by a waste management plan that demonstrates how 65% of the nonhazardous construction and demolition debris generated at the site will be recycled or salvaged?

If it is determined that a proposed project does not fall within the assumptions of the General Plan and/or is not consistent with the CAP, incorporating all applicable measures as binding and enforceable components of the project, further CEQA analysis would be required. The applicant must demonstrate to the City's satisfaction how the project will achieve its share of the established targets through the use of alternative design components and/or operational protocols to achieve equivalent reductions, or use permanent, verifiable and enforceable offsets that would result in emissions reductions in the City to achieve remaining reductions. The project would also be required to demonstrate that it would not substantially interfere with implementation of the CAP strategies or measures.